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ART. I. *An Account of the Arctic Regions, with a History of the Whale Fishery, &c.* By WILLIAM SCORESBY, Junior, F.R.S.E. 2 vols. 8vo. Pp. 1207. Constable & Co. 1820.

MR. Scoresby's work on the Arctic Regions, from the known skill and experience of its enterprising author, and from the opportunities he has enjoyed of joining the lights of science to his extensive observation, has long been expected with interest by the public; and although unnecessarily swelled out, perhaps, in some instances, and on the whole not very tastefully put together, it contains such a variety of curious and important information on the natural history of these countries, with such valuable details on the operations of the whale-fishery, that it forms altogether an extremely interesting production, and supplies, in the fullest manner of which the subject is at present capable, what has long been felt as a desideratum in geographical knowledge. It cannot well be appreciated from any general account of its contents; and we prefer, therefore, in addition to a slight analysis, to enter somewhat freely on a few of the topics discussed in it, which seem likely to interest our readers. Mr. Scoresby divides his labours into two parts, each of which forms a volume. The first of these relates to the progress of discovery in the Arctic regions, and the natural history of Spitzbergen and the Greenland sea; the other to the whale-fishery, as conducted in the seas of Greenland and Davis' Strait. We shall take them in order; but we shall first quote some of his prefatory remarks on the information to be derived from preceding authors.

"Though the natural history of the countries within the Arctic circle, and the nature and practice of the whale-fishery, possess peculiar, and, I may add, almost universal interest; yet it is remarkable that no original work, published in Britain, excepting a single

Tract by Henry Elking, appears to have been devoted entirely to either subject. In this respect, notwithstanding our important and extensive annual adventures to the seas of Greenland and Davis' Strait, we have been anticipated, and our supineness tacitly reproved, by several works that have appeared in other countries. Among foreign authors who have treated of the regions of the north, or of the whale-fishery, may be mentioned, La Martiniere, Pierre de Mezange, Boisgelin, and Fortia, though these are writers, it should be observed, who cannot be altogether followed;—M. la Peyronie, and Bernard de Reste, who have given translations in French, not altogether accurate, however, of works of some value;—and Torfæus, Otho Fabricius, Olafsen, Olaving, Egedé, Crantz, Zorgdrager, Eggers, Moriniere, and a few others, who have produced works of real merit.

The accounts of Greenland, by the faithful and enterprising Moravian Missionaries, Hans Egedé and David Crantz, whose zeal and philanthropy carried them into one of the most uncomfortable and inhospitable regions of the globe, but particularly the latter, are works of peculiar fidelity and value; and the account of the whale-fishery given by Zorgdrager, though written considerably above a century ago, is, perhaps, on the whole, the best that has appeared in any language. The works of Egedé and Crantz have been translated into English, and, with the article of Sir Charles Giesecké, in Dr. Brewster's Encyclopædia, and some others, included in works on miscellaneous literature or science, form the principal sources of information on the natural history of Greenland, published in the English language. The tract of Henry Elking, already alluded to, entitled, "A View of the Greenland Trade and Whale-Fishery, with the National and Private Advantages thereof," is, I believe, our only original work on this interesting subject.

"A considerable quantity of miscellaneous information, however, relating to Arctic countries and to the whale-fishery, is to be found interspersed through the Collections of Voyages, &c. by Hackluyt, Purchas, Churchill, Harris, Pickersgill, Goldson, Forster, Müller, Coxe, Pinkerton, Kerr, Clarke, Barrow, Burney, &c.; in the translations of the voyages or narratives of Barentz, Martens, M. Le Roy, &c.; and in the original voyages of Ellis, James, Fox, Ross, and others, into Baffin's or Hudson's Bay; of Cook into Behring's Strait; and of Phipps towards the north pole."

The first volume contains six chapters and an appendix, which may be thus summarily entitled: the question of the existence of a sea-communication between the Atlantic and the Pacific oceans, by the North—descriptive account of the Polar countries—hydrographical survey of the Greenland Sea—account of Polar ice—atmospherology and zoology of the Arctic Regions—meteorological and other tables, chronological account of voyages, and various like topics.

On the first of these subjects, our author occupies 92 pages, filled with evidences, in support of the existence of one or other sea-communication from the Atlantic into the Pacific ocean,

collected chiefly from old voyages. Little as we think of some of these, which, owing to their antiquity, consequently to their inaccuracy, must be received with great caution, as they are, perhaps, more chimerical than real; we find some difficulty in disposing of others, of a more recent date, and, in particular, of the following circumstance, which came under our author's own observation.

"The master," he remarks, "of the Volunteer whaler of Whitby, when near the coast of Spitzbergen, July 19, 1813. shewed me part of a lance which had been taken out of the fat of a whale, killed by his crew a few weeks before. It was formed of a hard grey stone, of a flinty appearance, about three inches long, two broad, and two-tenths thick. Two holes were pierced in one end of it, by which it appeared the stock or handle had been secured. It was completely imbedded in the blubber, and the wound was quite healed. A small white scar on the skin of the whale, alone marked the place where the lance had entered." Again, "in the year 1812, the crew of the Hull fisher, (the Aurora) met with a whale in the same region, having a harpoon made of bone sticking in its back; and a few years ago, a lance of stone, somewhat like the one above mentioned, fixed to a piece of bone, forming a socket for the stock, was likewise found in a whale by people of another Greenlandman of Hull: this stone-lance is now deposited in the interesting collection of natural rarities belonging to Mr. Hornsea of Scarbrough" "To these facts we may add," he continues, "many of a similar kind, together with others of whales struck in Davis' Straits having been killed near Spitzbergen, and *vice versa;* but the above will be sufficient for affording a strong confirmation of the opinion, that a sea communication between the Atlantic and Pacific Oceans by the north, does exist. For, with regard to the stone-lances and bone-harpoons found in the bodies of whales, it may be remarked, that as the Esquimaux of Davis Straits and Hudson's Bay, have now, from their long intercourse with Europeans, become well supplied with weapons calculated for the capture of the whale, made of iron, these instruments made of stone and bone, so much inferior, must have been used by some other persons who have not yet had intercourse with the civilized world; but as they are precisely the kind of weapons which were in common use among the Esquimaux a century ago, it is probable that the instruments alluded to were struck by some tribe of the same nation, inhabiting the shores of the frozen ocean, on the northern face of the American continent, yet unexplored."—Vol. I. p. 10.

From the year 1734, up to the present time, twelve voyages have been undertaken, chiefly by the Russians, for exploring Behring's Straits, without success. It is said, indeed, though we put little confidence in the report, "that an expedition, consisting of seven kotches, sailed from Kovima, in order to penetrate into the Eastern Ocean, on the 20th June 1648. Four of these kotches were never heard of after they sailed; one of

"the other three was wrecked on the great promontory; the "two remaining vessels were soon afterwards separated, and "one of them, commanded by Simon Deshneff, a chief of the "Cossacks, after being driven about by tempestuous winds until "the month of October, was wrecked near the Olutora, lying on "the east side of Kamtchatka, in the 60th degree of latitude; "and the crew, consisting of 25 persons, after reached the "Anadir." With regard to the existence of a north-west communication, and the practicability of effecting a passage into the Indian Ocean by that route, all that we shall say at present is, that we think the attempt worthy a great maritime nation, and that we rest fully assured, that the measures adopted by government, in concert with the Hudson-Bay company, when taken in connexion with the firmness, fortitude, and ardour of the officers commanding the land and sea expedition, now pending, afford the best promise of terminating satisfactorily a geographical dispute, which has agitated Europe during an extremely active period of 350 years.

It appears, from the investigations of our author, that the highest latitude ever attained by any navigator whatever, was 81.30, which was observed by himself, and is nearly 1° farther north than any other well authenticated observations extant. "Our latitude," he observes, p. 41. "on three occasions in May "1806, as derived from observations taken with a sextant by "myself and my father, was 80° 50′ 28″, 81° 1′ 53″, and 81° 12′ "42″; after which we sailed so far to the northward, as made "it about 81° 30′, which is one of the closest approximations to "the Pole which I conceive has been well authenticated." If such be the fact, and we have little doubt but it is, all attempts to reach the Pole with ships must end in disappointment; and, therefore, we are decidedly of opinion with our author, that if ever this object is attained, it can only be accomplished, as proposed in his project given at some length in the *Memoirs of the Wernerian Society*, by travelling over the icy continent, in sledges drawn by dogs or rein-deer. He enumerates many instances in confirmation of the practicability of such an undertaking; among which we find, p. 57. "that the North Ameri- "can Indians, who trade with the factories of the Hudson's Bay "Company, who reside at their settlements, have travelled 1000, "or 1500 miles, through snow on foot, in the course of the win- "ter." Two and three hundred miles in the depth of winter, through a wide open country, without meeting with any house to receive them, are journeys so common with the north American Indians, who trade with our settlers, as to excite among them no astonishment whatever. "On such journeys, when benight-

"ed on any open plain, they are forced to lie down without fire, "under shelter only of the snow." It is also mentioned, "that "a man can conveniently draw a load of above an hundred "weight upon a sledge, a distance of fifteen or sixteen miles in a "winter's day." The Russians are not a whit inferior to the North American Indians in this mode of travelling. When Captain Cook put into the Bay of Avatscha in Kamtschatka, for obtaining a supply of naval stores and provisions, a dispatch was sent off in a sledge drawn by dogs to Bolsherietzkoi, a distance of 135 English miles, to which an answer was returned on the fourth day; so that a journey of 270 miles upon snow, was performed in little more than three days and a half. At this time, the governor of Kamtschatka, Major Behm, assured Captain Cook, that the same journey was usually performed in two days and a half; and that he had once received a dispatch from the bay of Avatscha, which is the harbour of St. Peter and St. Paul, in twenty-three hours. Other instances are noticed by our author of the swiftness and alacrity by which Russians are in daily practice of travelling upon the snow, to illustrate the practicability of his bold plan, to which we have already alluded.

The following very interesting sketch of the scenery of Spitzbergen will be read with great interest; it is drawn by a masterly hand, and exhibits, in a very favourable point of view, Mr. Scoresby's powers of description.

"Spitzbergen, and its islands, with some other countries within the arctic circle, exhibit a kind of scenery which is altogether novel. The principal objects which strike the eye, are innumerable mountainous peaks, ridges, precipices, or needles, rising immediately out of the sea, to an elevation of 3000 or 4000 feet, the colour of which, at a moderate distance, appears to be blackish shades of brown, green, grey and purple; snow or ice in striæ or patches, occupying the various clefts and hollows in the sides of the hills, capping some of the mountain summits, and filling, with extended beds, the most considerable valleys; and ice, of the glacier form, occurring at intervals all along the coast, in particular situations as already described, in prodigious accumulations. The glistening or vitreous appearance of the iceberg precipices; the purity, whiteness, and beauty of the sloping expanse, formed by their snowy surfaces; the gloomy shade, presented by the adjoining or intermixed mountains and rocks, perpetually "covered with a mourning veil of black lichens," with the sudden transitions into a robe of purest white, where patches or beds of snow occur, present a variety and extent of contrast altogether peculiar; which, when enlightened by the occasional ethereal brilliancy of the polar sky, and harmonized in its serenity with the calmness of the ocean, constitute a picture both novel and magnificent. There is, indeed, a kind of majesty, not to be conveyed in words, in these extraordinary accumulations of snow and ice in the valleys, and in the rocks above rocks, and peaks above

peaks, in the mountain groups, seen rising above the ordinary elevation of the clouds, and terminating occasionally in crests of everlasting snow, especially when you approach the shore under shelter of the impenetrable density of a summer fog; in which case the fog sometimes disperses like the drawing of a curtain, when the strong contrast of light and shade, heightened by a cloudless atmosphere and powerful sun, bursts on the senses in a brilliant exhibition, resembling the production of magic.

"To this strong contrast of light and shade, with the great height and steepness of the mountains, is to be attributed a remarkable deception in the apparent distance of the land. Any strangers to the arctic countries, however well acquainted with other regions, and however capable of judging of the distance of land generally, must be completely at a loss in their estimations when they approach within sight of Spitzbergen. When at the distance of twenty miles, it would be no difficult matter to induce even a judicious stranger to undertake a passage in a boat to the shore, from the belief that he was within a league of the land. At this distance, the portions of rock and patches of snow, as well as the contour of the different hills, are as distinctly marked, as similar objects, in many other countries, not having snow about them, would be at a fourth or a fifth part of the same distance. Not, indeed, strangers only, but persons who have been often to Spitzbergen, such as the officers and seamen of the whale-ships, have not unfrequently imagined, that their ship could not stand an hour towards the land without running aground; and yet, perhaps, the ship has sailed three or four hours directly 'in shore,' and still been remote from danger.'—Ib. p. 109, &c.

A curious circumstance of the kind, related in a Danish voyage undertaken for the recovery of the lost colony in Greenland by Mogens Heinson, is noticed by our author, and is readily explained on the principle now adverted to—the deceptive appearance of the land occasioned by the state of the atmosphere.

"This person," says he, p. 112, "who passed for a renowned seaman in his day, was sent out by Frederick II. King of Denmark. After encountering many difficulties and dangers from storms and ice, he got sight of the east coast of Greenland, and attempted to get to it; but though the sea was quite free from ice, and the wind favourable, and blowing a fresh gale, he, after proceeding several hours without appearing to get any nearer the land, became alarmed, tacked about, and returned to Denmark. On his arrival, he attributed this extraordinary circumstance, magnified, no doubt, by his fears, to his vessel having been stopped in its course, 'by some loadstone rocks hidden in the sea!'"

Mr. Scoresby originally intended to give a general description of all the countries lying within the Arctic zone; but he relinquished the idea on the appearance of several works, which he conceived to supply the desideratum respecting several of the countries, as Sir Geo. Mackenzie's and Mr. Ebenezer Henderson's on Iceland, and Professor Giesecke's treatise on Greenland.

He consequently abridged his plan, and confined his remarks to those regions, of which his own personal observations enabled him to furnish an original description. This is one evidence of his moderation, to which for our own parts we are *not* disposed to extend praise, and which, as it appears to us, is not very reconcileable with the title or the object of his valuable compilation. He might, we think, have condensed an account of the countries now mentioned within a moderate space; and it certainly would have been an advantage to the reader who had access to the books to which he thus refers, that the outline of so competent a master guided him in his perusal of them. The chapter, therefore, which is allotted to a descriptive account of the polar countries, forms but a small part of his work, extending only from page 92 to page 169, and comprising only Spitzbergen and the adjacent islands. His opportunities of visiting the former were greater than usually happen to persons who frequent those regions; or rather his philosophical ardour induced him to make opportunities. The sketch we have just given proves the interest he took in its rude beauties. But that is by no means the only evidence of his anxiety to explore and illustrate it. Besides rambling over all the country that was accessible, describing some of its hills and other remarkable points, and taking several angles and bearings of the most prominent parts of the coast, so as materially to improve our geographical knowledge of it, he collected specimens of its minerals, observed its zoology, and determined the character of its very scanty Flora. Some of these topics are particularly and scientifically treated of in the Appendix, in which our author communicates the remarks of Professor Jameson, and Mr. Robert Brown, librarian to Sir Joseph Banks, on the articles submitted to their examination. The plants, as might be expected, are chiefly cryptogamic, a few only being referrible to the definite classes, as one to each of the *hexandria*, *icosandria*, *didynamia* and *diœcia;* two to the *polyandria;* three to the *tetradynamia;* and six to the *decandria*. Vegetation goes on with amazing celerity in this bleak region, most of the plants springing up, flowering, and yielding seed in about a month or six weeks. They are quite dwarfish, however, the tallest plant of the nature of a tree seen by our author (viz. a salix,) not exceeding the height of three or four inches; and their flowers, though they are described as having considerable beauty, exhibit few other colours than yellow, white, and purple. The specimens of minerals collected by Mr. Scoresby, were varieties of *gneiss*, some of which inclined to *granite; mica-slate*, sometimes passing into *clay-slate; quartz-rock* in two states, granular and splintery, some of the

specimens containing *mica* but no *felspar*, and both kinds having *iron-pyrites* disseminated through them; and *calcareous-spar*, which occurred only in veins in *limestone*, apparently the most abundant rock in this island, and which occasionally forms a marble of great beauty. Coal, of tolerable quality, is also found in some parts of Spitzbergen.

"From these specimens," says our author in his Appendix, "which were all the varieties met with in two or three excursions to the shore, it appeared to Professor Jameson that the mountains and shores of Spitzbergen visited by me, are formed of gneiss, mica-slate, and quartz-rock, which contain great and frequent beds of bluish-coloured limestone. No secondary rocks, such as sandstone, basalt, clinkstone, or others of a similar description, nor any rock of volcanic formation, were met with. In this respect Spitzbergen is remarkably distinguished from Jan Mayen, (with which Cherie Island seems to agree,) where all the rocks are secondary trap or volcanic. Nova Zembla is said to have the same geognostical features as Spitzbergen; and West Greenland abounds in primitive rocks, but contains few species of the secondary class. Probably Spitzbergen and Nova Zembla were formerly more intimately connected than they are at present."

Of the smaller islands described by Mr. Scoresby, two of which have just been named, we think it unnecessary to say much. *Moffen Island*, lying to the north of Spitzbergen, is very low, of a roundish form, about two miles in diameter, having a shallow lake of water in the middle that was almost entirely frozen over near the end of June, and does not exhibit a trace of vegetation. *Low Island*, to the E. N. E. of the preceding, is very flat, about seven miles in length. Both of these islands are described in the account of Phipps' voyage. *Hope Island*, on the south-east coast of Spitzbergen, is a long narrow slip, surmounted by five considerable elevations. *Cherie*, or *Bear Island*, lies 130 miles S.S.E. from Point-look-out, the southernmost point of Spitzbergen, and is about ten miles long, of a saddle-like form. It abounds with bears, foxes, and sea-fowl, and, besides coal of pretty good quality, exhibits some lead-ore, and specimens of virgin silver. "It is often inaccessible on "account of ice, which, in the spring of the year, generally "stretches in a straight line from here to the southern Cape of "Spitzbergen." *Jan Mayen Island*, which is placed by our author between latitudes 70° 49′ and 71° 8′ 20″ N., and longitudes 7° 26′ and 8° 44′ W., is about ten leagues long and three in breadth. Its coast affords several road-steads and good anchorage. In the spring of the year it is usually surrounded with ice, which sets so far to the westward towards the end of summer, as not to be visible from any part of the island. Jan Mayen, often approached by the fishers, is rarely visited by them, and has never

been well described. Our author landed on it in 1817, when he made remarks which were afterwards read to the Wernerian Society of Edinburgh, and of which he gives the substance in the present work. The appearance of the land strikingly resembles that of Spitzbergen in colour and character; and the approach to it also, from the cause formerly assigned, appears amazingly tardy. A frost-piece, descriptive of part of its scenery, strikes us as a very beautiful picture; and, at the hazard of some length, we shall contrast with it another sketch, which must contain all that we can say more of this remarkable island.

"Between Capes North-east and South-east, are three very singular icebergs. They occupy recesses in the cliff, where it is 1284 feet high by observation, and nearly perpendicular, and extend from the base of Beerenberg down to the water's edge. These polar glaciers differed in appearance from any thing of the kind I had before seen. They were very rough on the surface, and of a greenish-grey colour. They presented the appearance of immense cataracts, suddenly arrested in their progress, and congealed on the spot, by the power of an intense frost. Like cascades, their prominent greenish colour was variegated with snow-white patches resembling foam, which were contrasted with the jet-black points of the most prominent rocks pressing through their surfaces. As in cataracts also, they seemed to follow in some measure the figure of the rocks, over which they lay, and were marked with curvilinear striæ from top to bottom."

"After leaving the sea-shore, I perceived no other mineral but such as bore undoubted marks of recent volcanic action, viz. cinders, earthy-slag, burned clay, scoriæ, vesicular lava, &c. The place from whence these substances appeared to have been discharged, being near, we attempted to reach it. In performing the ascent, the steepness of the hill, and the looseness of the materials, made the undertaking not a little arduous. We frequently slid backward several paces, by the nodules of lava giving way beneath our feet; in which case, the ground generally resounded, as if we had been travelling on empty metallic vessels, or vaulted caverns. The baked clay, and other loose rocks, consisted chiefly of large masses at the bottom of the hill; but, about the middle of the ascent, these substances were in smaller fragments. Towards the top, blocks of half-baked red clay, containing many crystals of augite, were again met with; and, about the southern part of the summit, a rugged wall of the same occurred, giving the mountain a castellated form of no small magnificence. On reaching this summit, estimated at 1500 feet elevation above the sea, we beheld a beautiful crater, forming a basin of 500 or 600 feet in depth, and 600 or 700 yards in diameter. It was of a circular form, and both the interior and exterior sides had a similar inclination. The bottom of the crater was filled with alluvial matter to such a height, that it presented a horizontal flat of an elliptical form, measuring 400 feet by 240. A subterranean cavern penetrated the side of the crater at the bottom, from whence a spring of

water issued, which, after running a short distance towards the south, disappeared in the sand. From this eminence we had a most interesting prospect. Towards the north appeared Beerenberg, now first seen from the clouds, rising in majestic importance into the region of perpetual frost. At the foot of the mount, on the south-east side, near a stupendous accumulation of lava, bearing the castellated form, was another crater, of similar form to the one above described. Towards the south-west, the utmost extent of the island was visible; while, towards the north, a thick fog obscured the prospect, which, as it advanced in stately grandeur towards us, gradually shrouded the distant scenery, until the nearest mountains were wrapped in impenetrable gloom. The sea at the same time was calm, the sun bright, and the atmosphere of half the hemisphere without a cloud. Excepting the interest excited by the volcano, Beerenberg sunk every other object into comparative insignificance.—The colour of the cliffs around was different shades of brown or black; and the general character of the country seemed to indicate the action of volcanic fire.—As the icebergs observed on this island suggested the idea of frozen cascades, a poetic imagination would, in the hollow metallic sound of the earth on the volcanic mount, have conceived the cavern of Vulcan; and in the iron manufactured in the bowels of the earth, the fabrication of the same deity, for the use of his parent Jove."—Ib. p. 159, &c.

The third chapter, entitled Hydrographical survey of the Greenland sea, treats of its situation and extent—its colour and degree of transparency—the quality, specific gravity, and saltness of its waters—its temperature, depth, and pressure—and concludes with some remarks on the currents of the Arctic sea, and observations respecting waves. We shall briefly notice those topics which we conceive to be of most interest from their novelty or their relation to science. First then as to the colour of the sea. This is known to vary much, owing to several circumstances, as the effect of the sun, the colour of the clouds, the nature of the bottom, the presence of animal or vegetable substances in the waters. A good deal of caution is requisite to detect the modifying causes; and in particular it is necessary to guard against the reflection of the rays of light, and to endeavour to obtain what may be denominated a view of the interior of the sea. The colour of the Greenland sea is not always alike, but varies from ultra-marine blue to olive-green, and from perfect transparency to a remarkable opacity; and these changes are owing to the quality of the water at different times and in different places. The green-coloured water has not been observed by every navigator in these regions, or at least is not mentioned by all the writers who have given narrations of their voyages. It is liable to alterations in its position, and to considerable variations in point of dimensions and course. Mr.

Scoresby has usually found it constituting one-fourth part of the surface of the Greenland sea, between the parallels of 74° and 80°, and very frequently in the meridian of London at high latitudes. The result of some of his observations on the subject will be most shortly given in his own words.

" In the year 1817, the sea was found to be of a blue colour, and transparent, all the way from 12° east, in the parallel of 74° or 75°, to the longitude of 0° 12′ east, in the same parallel. It then became green, and less transparent. The colour was nearly *grass-green*, with a shade of black. Sometimes the transition between the green and blue water is progressive, passing through the intermediate shades in the space of three or four leagues; at others, it is so sudden, that the line of separation is seen like the rippling of a current; and the two qualities of the water keep apparently as distinct as the waters of a large muddy river, on first entering the sea. In 1817, I fell in with such narrow stripes of various coloured waters, that we passed streams of pale green, olive green, and transparent blue, in the course of ten minutes sailing." Ib. p. 176.

These observations were not allowed to be recorded merely as ultimate facts, and unconnected with the ever-beneficent and providential purposes of the great Creator; but will speedily be found as leading to a very important conclusion. It is well known to the fishers, that the food of whales occurs chiefly in the green-coloured water, where, of course, they are most frequently found. Mr. Scoresby was induced to prosecute examination into the reason of the colour, which he at first imagined might be occasioned by the nature of the bottom. This opinion was soon given up, and he became convinced, that the cause must be sought for in some yellow substance held in suspension by the water, which often marked the edges of pieces of ice seen floating in it, and which, by combining with the natural blue of the sea, produced the peculiar tinge observed. A little snow obtained from one of these pieces of ice, being dissolved in a wine glass, appeared perfectly nebulous, and the water procured from it was found to contain a great number of semi-transparent spherical substances, with others which resembled small portions of fine hair. He subjected these to a compound microscope, which led to the highly probable conviction that these bodies were either distinct animals, or animal products. See his conclusions.

" I afterwards examined the different qualities of sea-water, and found these substances very abundant in that of an olive-green colour; and also occurring, but in lesser quantity, in the bluish-green water. The number of Medusæ in the olive-green sea was found to be immense. They were about one-fourth of an inch asunder. In this proportion, a cubic inch of water must contain 64; a cubic foot 110,592; a cubic fathom 23,887,872; and a cubical mile about

23,888,000,000,000,000! From soundings made in the situation where these animals were found, it is probable the sea is upwards of a mile in depth; but whether these substances occupy the whole depth, is uncertain. Provided, however, the depth to which they extend be but 250 fathoms, the above immense number of one species may occur in a space of two miles square. It may give a better conception of the amount of Medusæ in this extent, if we calculate the length of time that would be requisite, with a certain number of persons for counting this number. Allowing that one person could count a million in seven days, which is barely possible, it would have required, that 80,000 persons should have started at the creation of the world, to complete the enumeration at the present time! What a stupendous idea this fact gives of the immensity of creation, and of the bounty of Divine Providence, in furnishing such a profusion of life in a region so remote from the habitations of men! But if the number of animals in a space of two miles square be so great, what must be the amount requisite for the discolouration of the sea, through an extent of perhaps twenty or thirty thousand square miles?

"These animals are not without their evident economy, as on their existence possibly depends the being of the whole race of mysticete, and some other species of cetaceous animals. For, the minute Medusæ apparently afford nourishment to the Sepiæ, Artiniæ, Cancri, Pelices, and other genera of Mollusca and Aptera, so abundant in the Greenland sea; while these latter constitute the food of several of the whale tribe inhabiting the same region; thus producing a dependant chain of life, one particular link of which being destroyed, the whole must necessarily perish." Ib. p. 178, &c.

The next subject which we shall notice, is the effect of the pressure of the sea at great depths, respecting which Mr. Scoresby has the merit of instituting some experiments and ascertaining some facts of a highly interesting nature. His attention appears to have been directed to the inquiry, by an accidental circumstance which occurred to his father in 1794, and which he found recorded in that gentleman's log-book. A whale that had been struck, exhausted in its descent all the lines out of the boat, before assistance could be given, and then dragged the boat itself *under* water, the men escaping to a piece of ice. On first returning to the surface to take air, the whale was again struck, and soon afterwards expired; but, in place of remaining at the surface, as is usual on that event, it began to sink. Mr. Scoresby, observing this uncommon circumstance, seized a grapnel, fastened a rope to it, and threw it over the tail of the animal, which he succeeded in hooking. Still, however, the animal continued to sink. Its descent was at last stopped by the lines attached to it. A loop of another rope being now passed round the first, and allowed to drop below it, inclosed the line belonging to the boat, which still remain-

ed down in the water, and which was ascertained to be the cause of the phenomenon. The harpoon then slipped out of the whale, and would, together with the line and sunken boat attached to it, have been lost, had it not been luckily caught by the rope used to encompass the fish, which, being relieved from the pressure or weight of the sunk boat and line, rose to the surface. The strain, thus transferred altogether from the fish, was still so great, that Mr. Scoresby imagined the boat had been entangled among rocks at the bottom of the sea. He estimated the weight of resistance at not less than three-fourths of a ton, and it was found that the utmost power of twenty-four men, hauling the line for several hours, was required to overcome it. It appears then, that the boat, which before the accident would have been buoyant though full of water, had acquired an extraordinary increase of gravity.

"When it was hoisted into the ship," we are told, "the paint came off the wood in large sheets, and the planks, which were of wainscot, were as completely soaked in every pore, as if they had lain at the bottom of the sea since the flood. A wooden apparatus that accompanied the boat in its progress through the deep, consisting chiefly of a piece of thick deal, about fifteen inches square, happened to fall overboard, and though it originally consisted of the lightest fir, sunk in the water like a stone. The boat was rendered useless; even the wood of which it was built, on being offered to the cook as fuel, was tried and rejected as incombustible!" Ib. p. 199.

Such then was the phenomenon which suggested to the younger Scoresby the series of experiments, the nature and results of which we mean briefly to communicate. Having attached several pieces of wood, of various qualities, to an instrument which he had constructed, and to which from its use he gave the name of the *marine-diver*, he sent them down into the ocean, to the depth of 4000 feet; while corresponding pieces were immersed in a bucket of sea-water, during the time that the former were undergoing their submarine operation. The purpose of employing duplicates in this manner, as the reader will easily infer, was to discriminate between the difference of weight occasioned by impregnation produced by pressure in the former case, from that of absorption effected by simple immersion in the latter. The pieces which had been sunk were all found to be specifically heavier than sea-water; and the effect of impregnation was discovered to be different in different kinds of wood. His experiments were subsequently repeated in an improved manner, and afforded him the materials of a table which he has exhibited in his work. We cannot make room for it in our pages, but as the subject is highly curious, and may eventually prove serviceable, we shall quote Mr. Scoresby's inferences thence deduced.

"From this table we may observe, that the greatest increase of specific gravity, by pressure, in the specimens of the different kinds of wood submitted to experiment, was obtained by the fir; the next greatest by the ash; the next by the elm; the next by the oak; the next by the teak; the next by the hickery; and the last by the mahogany. The cork gained still less than any of the pieces of wood. The proportion of impregnation of the same kind of wood, in specimens of different sizes and shapes, (this variation of the experiments, by employing pieces of different shapes, was suggested by Professor Leslie), is derived from the experiments made on the ash; and it is curious to observe, that the largest cube of ash, and the parallelopipedon of the same, received the greatest proportional increase of weight; while the smaller pieces received less and less additional weight, per cubic inch, as they decreased in size. It is also a little curious, that the specimens sent to the depth of 2058 feet, were as much impregnated as those sent down above 6000 feet. The degree of impregnation produced by immersion to the depth of 2058 feet to 6348 feet, varies irregularly, but is evidently as great at the depth of 2058 feet, as under any superior pressure; so that it is probable that the greatest permanent impregnation by pressure, of such open-grained woods as ash, elm, fir, &c. is produced at the depth of 300 or 400 fathoms. Hence it is clear that no use can be made of this effect of pressure, for determining the depth, unless it be within 2000 feet of the surface; and even in this limit, the results may be uncertain. From comparison it appears, that an effect of the impregnation of the wood with sea-water, was to increase its dimensions, as well as its specific gravity; each specimen, on an average, having swelled 0.05 cubic inch in every solid inch of original dimensions, and gained 84 grains on every 100 grains of original weight; that is, an increase of one-twentieth in size, and twenty-one twenty-fifths in weight. I have little doubt, but the degree of impregnation always increases with the increase of pressure; but the air contained in the pores of the wood, which is never wholly disengaged, exerting an expansive force when the load of pressure is removed, forces part of the water out again. This was clearly discernible in some of the specimens used in the foregoing experiments, at the moment they were hauled up, their surfaces being covered with a thin pellicle of froth. Hence pieces of fir sometimes became buoyant, after being a few hours relieved from pressure, though kept constantly under water; but all other kinds of wood yet tried, though they lose a little of their moisture, yet remain specifically heavier than water, as long as they are kept immersed. Blocks of wood, indeed, are now in my possession, that were soaked with sea-water in the year 1817, and yet remain, at the bottom of a vessel of water, nearly as heavy as when first drawn up out of the sea. The degree of pressure at the depth to which I sounded in my last experiment, is not a little astonishing, being under a column of water, 6348 feet in length, at least, 2823 lb. or 25 cwt. 23lb on one square inch of surface. Hence on the larger cubes of ash used in the experiment, though measuring only 1.59 inches in diamater, the whole pressure must have exceeded nineteen tons! In this calculation, as well as others of the same nature, the weight of the column of

sea-water is taken throughout, the same as at the surface, where a cubic inch temperature 30°, weighs 259.58 grains. As, however, water is found to be somewhat compressible, its weight, at great depths, must be greater than at the surface; and consequently the whole pressure on the specimens of wood, greater than in the above estimation." Ib. p. 201. &c.

Mr. Scoresby's remarks on currents, though they do not convey to us much that is new, are satisfactory so far as they go. After stating in a very general manner the course of what is usually known by the name of the Gulf Stream,—that great marine current which stretches westward across tropical seas, and a branch of which, having doubled the Cape of Good Hope, advances northerly along the western coast of Africa, whence it proceeds across the Atlantic to the Gulf of Mexico, and, passing by the Bahama Islands, is urged towards Newfoundland,—he takes notice of some of its branches, or supposed branches, and other currents of the northern regions. This stream is conceived to be met on the great bank of Newfoundland by a current setting southward from Baffin's Bay and the coast of Greenland, and to be deflected into two branches, towards the E.S.E. and E.N.E. by which, as is commonly known, various productions of America and the West Indies, as well as light articles thrown overboard or set at liberty from vessels wrecked in Davis Straits and elsewhere, are occasionally directed to the coasts of the British isles and other European countries. The northern branch of the Gulf Stream is supposed by our author to extend superficially from the coast of Britain towards the North Sea, along the shore of Norway; about the North Cape to have its direction changed by a westerly current from Nova Zembla; and afterwards to set towards the north-west, so as to prevent the ice, that would otherwise be propelled southwards by the polar current, from spreading across the North Sea. A short paragraph from the work will contain all that we mean to say as to any other of his opinions concerning currents.

"Within the Arctic Circle, from the north-eastern point of Russia to the coasts of Greenland and Labrador, the prevailing current at the surface, is from east to west, from north-east to south-west, or from north to south.—Along the northern face of Russia, the current is decidedly from the east towards the west, following the line of the coast. After passing Nova Zembla, it sets westerly to Spitzbergen, where one part proceeds round Point-look-out, and along the western shore towards the north, until it meets with another branch passing to the northward of these islands; these two branches then reuniting, proceed a little to the westward; and afterwards, being deflected towards the south by the coast of Greenland, proceed regularly towards the south-west, setting with a much greater velocity near the Greenland shore than in the vicinity of Spitzbergen. Pursuing its course

along the east side of Greenland, the current passes to the westward of Iceland, down to Cape Farewell. Having doubled this promontory, according to the opinion of O. Fabricius, it is urged northward; but meeting with another current setting down the Strait of Davis, before it reaches Disco Island, it is probably deflected to the westward, when the accumulation of waters on the western side of the strait, escapes to the southward, along the American shore."—Ib. p. 211, &c.

The fourth chapter, which treats of the Greenland or Polar ice, is of peculiar moment, both as it exhibits, in a very luminous manner, the singular wonders of the Arctic regions, and relates to the nature and difficulties of the whale-fishery carried on in them. The ice met with in the Polar Seas is considered to be of various kinds, and has accordingly obtained various denominations in the language of navigators and fishers. The circumstances which have led to different names are, chiefly, the size and shape of the pieces, their number and connection, their thickness, transparency, situation, and the quality of the water whence they are supposed to be formed, and to which they may again be reduced. The difference which we shall first mention is that of *salt-water-ice* and *fresh-water-ice*—a distinction which, though in one sense, as will appear, merely nominal, has undoubted claims to be preserved. When the sea freezes, the salt which it contained in solution is deposited, and hence the frozen mass, properly speaking, consists of fresh water, which may consequently be produced from it. But the fact is, that this kind of ice, being porous, is apt to retain a large portion of salt water in an unfrozen state, which will of course impart a saltness to the liquified product. Ice formed from sea-water, for the reason now mentioned, does not seem so solid and transparent as that which arises from snow, rain, or river water; and by this circumstance, as well as by the water procured from it being scarcely potable, it is discernible from fresh-water ice. It appears of a blackish colour in the water, of a white or grey colour in the air, and is somewhat opaque, unless when in very thin pieces, but transmits the rays of light with a blue or bluish-green shade. The fresh-water ice is distinguished by its black appearance when floating in small pieces, and by its transparency in the air, when however it is usual to observe in it small globular or oval-shaped air-bubbles. It is very easily broken, though hard, and its edges are often so sharp as to give a wound like glass. From its great transparency it is sometimes capable of being formed into lenses, which have the property of concentrating the rays of the sun, and so acting in the manner of burning-glasses. With a lump of this kind, formed by means of a small axe, scraped with a knife, and polished by the warmth of the hand, Mr.

Scoresby frequently amused himself with burning wood, firing gun-powder, melting lead, lighting tobacco-pipes, to the no small amusement of his unscientific companions, who were perfectly astonished, that while the rays of the sun which proceeded through it were so hot as to scorch their hands, the lump itself remained firm and of its natural temperature.

Ice when just forming and exhibiting the appearance of crystals, is called by the sailors *sludge*, and resembles snow when cast into water that is of too low a temperature for its solution. In this state it has a smoothing effect on the surface of the sea like that of oil. The crystals, when about to unite, would form a continuous sheet, but their junction is for some time interrupted by the action of the waves, which, continuing to operate during the freezing process, give a rounded and turned-up edge to the coalesced pieces. These are accordingly denominated *cakes* or *pancakes;* and as they unite, larger and larger flakes are formed, until they become perhaps a foot in thickness and several yards in size. But even in these augmented portions, the impressions of their component parts are retained, so that the mass takes on the appearance of a pavement. When the sea is very smooth the consolidation goes on more rapidly, as well as more regularly. In this case the additions to the regular crystals appear to take place in the under surface. Ice of this kind and the cake ice are termed *bay-ice*, probably because it is in bays, where there is of course the greatest chance of calms and a still water, that they are the most likely to be formed. These, however, bear only a small proportion to those *fields* of ice which are to be met with in the Arctic regions, which are often of the diameter of twenty or thirty miles, sometimes of fifty or near a hundred, and which vary in thickness from ten to forty or more feet. The mode by which such immense masses are formed is a problem which we shall not at present attempt to solve, though aided by a very ingenious theory of our author. They commonly make their appearance in the month of May or June, have an invariable tendency to drift to the south-westward, and, on emerging from amidst the smaller ice, which, for a time, affords them shelter, are broken up by the swell, and are partly dissolved and partly converted into what is called *drift-ice*.

"The power of a swell in breaking the heaviest fields," says our author, "is not a little remarkable. A *grown* swell, that is so inconsiderable as not to be observed in open water, frequently breaks up the largest fields, and converts them wholly into *floes* and *drift-ice* in the space of a few hours; while fields composed of *bay-ice* or *light-ice*, being more flexible, endure the same swell without any destructive effect.

"The occasional rapid motion of fields, with the strange effects

produced by such immense bodies on any opposing substance, is one of the most striking objects the polar seas present, and is certainly the most terrific. They not unfrequently acquire a rotatory movement, whereby their circumference attains a velocity of several miles *per* hour. A field thus in motion, coming in contact with another at rest, or more especially with another having a contrary movement, produces a dreadful shock. A body of more than ten thousand millions of tons in weight, meeting with resistance when in motion, produces consequences which it is scarcely possible to conceive! The weaker field is crushed with an awful noise; sometimes the destruction is mutual: pieces of huge dimensions and weight are not unfrequently piled upon the top, to the height of twenty or thirty feet, while a proportionate quantity is depressed beneath. The view of those stupendous effects in *safety*, exhibits a picture sublimely grand; but where there is a danger of being overwhelmed, terror and dismay must be the predominant feelings." Ib. p. 246, &c.

Of the fixed *ice-bergs*, a term applied to the glaciers of the Arctic regions, we have already taken notice. The same name is also given to those large peaks or mountains of ice, which, in place of being attached like the former, are seen floating on the sea,—and of these it is necessary also to make mention. They occur often in the Spitzbergen sea, but are not found there of such sizes as they are known to attain in Hudson's Strait, Davis' Strait, and Baffin's Bay, where they have been sometimes known to be of the thickness of 500 or 600 yards; but the common size of them is that of the hull of a ship. They are of various shapes, though, generally speaking, they have one high perpendicular side, the opposite side very low, and the intermediate surface of a sloping form. Their colour also varies according to their consistency, distance, and other circumstances; usually they look like chalk or whitish marble, and reflect the sun's rays, so as to exhibit a glistening appearance. The dangers to be apprehended from these floating mountains are the greater, as will easily be understood, when they occur in extensive and numerous chains, which, by involving vessels, may either crush them in pieces, or otherwise inflict fatal violence. When single they are comparatively little to be dreaded; and oftentimes, indeed, they minister safety to the mariner by affording a stable mooring in strong adverse winds, or by providing a quiet lee-side when a state of rest is required for some of his operations. Even this, however, is not always free from danger, as the ice-bergs, besides their singular liability to be fractured, as on being struck with an axe, for example, are sometimes so nicely balanced as to be easily overturned; "and," says our author, "while floating in a tide-way, should their base be arrested by the ground, their detrusion necessarily follows, attended with a thundering noise, and the crushing of every object they encounter in their descent. Thus have vessels

been often staved, and sometimes wrecked, by the fall of their icy mooring, while smaller objects, such as boats, have been repeatedly overwhelmed, even at a considerable distance, by the vast waves occasioned by such events."

The fifth Chapter contains a variety of new, curious, and interesting matter regarding the meteorology of the Arctic regions. It is entitled "Atmosphereology," a new, barbarous, and unnecessary phrase. Mr. Scoresby's language in general admits of some improvement, and the use of such words as "disarrangement for derangement," "habitude for habit," "evidenced for evinced," and others, is not in the best taste. The Arctic climate is an interesting subject of inquiry, both in a philosophical and historical point of view; and though its extreme severity is well known, and forms indeed by its effects, by far the most striking feature of these regions, we as yet know very little of it from actual observations with the thermometer. In the 2d Section, and in the references to the Appendix, Mr. Scoresby has brought together a variety of meteorological observations, tables and registers, collected during his voyages, evidently with great industry and care, and, we have no doubt, with perfect accuracy; mixed, however, with abundance of speculation, and of extraneous matter. These observations form by far the most extensive and regular series that has hitherto been made. They are hence extremely valuable, and, when duly considered and combined with those of future observers, will, we have no doubt, throw light on the real gradation of this northern climate, in which Mr. Scoresby believes he has discovered unexpected anomalies. From the nature of the voyage, however, they are still far from being quite so satisfactory as could be wished, as they comprehend only three months of the year, and have not been taken even in these at any one place, but while the vessel was sailing about in all directions through different latitudes; they are therefore incapable of leading to any direct result regarding the medium temperature of the whole year, or of any given latitude. This defect is, no doubt, supplied in some measure by their number, which tends to afford a more exact average; but still this circumstance is scarcely sufficient to inspire that confidence in the accuracy of these deductions, which the cautious spirit of philosophy demands. All Mr. Scoresby's observations tend, unquestionably to assign a remarkable degree of cold to the month of April. He estimates it himself at 14°, while that of July he makes as high as 37°; the difference between April and July being thus 23°, or nearly double the difference between the same months in London; whereas it is generally understood that to-

wards the extreme north the vicissitudes of the seasons rather diminish than increase. We shall not attempt, at present, to explain the reason of this curious fact. Mr. Scoresby extends it, by analogy, to the rest of the year, and ascribes the increasing cold to the frigorific effect of the ice. This conclusion he founds on the principle of the sufficient reason; "because," says he, "there is no other known cause why there should be any "difference at all," between theory and observation; a curious example how cautious we ought to be of admitting into philosophy principles at variance with common sense. It is obviously no explanation at all, as the frigorific effect of the ice, which of itself can neither generate nor destroy heat, requires still to be accounted for.

In the field of conjecture and hypothesis indeed into which Mr. Scoresby has chosen to enter, he appears to but little advantage, and is far from displaying that intelligence and knowledge of his subject so conspicuous in other parts of the work. Without stopping, at present, to examine the details, we shall only remark, that the sum of all these elaborate calculations, is intended to shew, that, in the medium latitude of Spitzbergen or in the degree of N. Lat. 78°, the thermometer, in the middle of summer, rises to about 37°, and sinks again in winter to 1 degree below 0, *i. e.* that it rises to 5° above the freezing point on the one hand, and falls 38° below it on the other—the mean temperature of the whole year being no higher than 17°, and at the pole itself as low as 10°. This conclusion, so repugnant to what both theory and observation should lead us to expect, and so obviously inconsistent with the appearance of the Arctic regions, as described even by Mr. Scoresby himself, is chiefly made out by supplying the deficiency of his own registers from those kept in the latitude of 59°—and transferring to Spitzbergen, without any allowance, the gradation of climate observed in Stockholm. Now, it seems quite clear, that the variation of climate in Stockholm will not apply to the different circumstances of the countries within the Arctic circle, so much higher in latitude, and where, above all, nature introduces a new and very powerful agent to temper the inequalities of the seasons; the intense heat of summer, which is here spent in melting the fields of ice, being again gradually given out in winter, as frost resumes and extends its sway; and each cubic foot of ice, communicating to the atmosphere as it freezes, and again absorbing from the sun in the act of thawing, as much heat as would raise the temperature of an ordinary room at least 50 degrees. Though the temperature of the month of April, therefore, should correspond with the medium of the whole

year at Stockholm, it by no means follows that the same law will obtain in lat. 78°. But if the medium temperature were at all so low as is here represented, no sea could withstand the refrigerating energy, added to the unceasing operation of so intense a degree of cold. In place of that free communication under the ice, which Mr. Scoresby thinks is indicated by a current flowing from Behring's Straits to the Greenland seas, and to the effect of which he ascribes those enormous fields of ice to the amount of 15,000 square leagues, that he maintains are annually transported from the south and east, to be dissolved in warmer latitudes,—instead of that perfect fluidity of the arctic abyss which this submarine opening would imply under the pole itself, the whole ocean would become a solid rock; the ice, instead of forming a line from the shores of Greenland to Spitzbergen, would accumulate from year to year, and, extending beyond the Arctic circle, would entirely interrupt the navigation of the northern seas. The whole frigid zone, in short, being now enveloped within the line of perpetual congelation and under the absolute sway, therefore, of eternal frost, would present a scene of unmingled desolation, of which its present condition affords no adequate idea. From these general views, therefore, and without entering into any minute details, we may be assured that Mr. Scoresby's calculations on this subject are made very much at random. From the reports of the earliest navigators, it appears certain, that, during a period of 200 years, the state of the ice in the Arctic seas has suffered no sensible increase or diminution; while it continues, therefore, as we observe it at present, to be annually destroyed in the place of its formation, we are entitled to conclude, from this remarkable fact, till we obtain more exact observation, that the mean temperature of the year, at least along the barrier of ice, will not vary much from that of the freezing point of fresh, or of sea-water; and the following considerations render it probable that the same degree of mean annual heat extends with little variation to the pole itself.

It seems an established principle in physics, that all our diversities of climate arise chiefly from two great causes—the very unequal action of the sun on the different parts of the earth's surface, and the mitigating influence of the atmosphere, which prevents this inequality from rising to any immoderate extreme. The first depending altogether on the roundness of the earth's figure, and its diurnal and annual motions, exposing continually the higher latitudes to the less direct, and therefore less intense action of the great luminary from which heat is derived—the first cause depending thus on physical circumstances well ascertained, its influence

can be calculated with precision for different latitudes; and the effect of the second is only, by the incessant action of the winds, to modify the original and predominating law of climate. It hence appears that though the unequal action of the sun ought to produce a gradual decrease of temperature from the equator towards the poles, this diminution would not proceed at the same rate throughout. In the torrid zone the variation would go on very slowly, but in the middle latitudes with much greater rapidity, and the rate of decrease would again decline towards the poles; so that while the character of the climate in the temperate zones would comprehend great varieties, it would be much nearer upon an equality through the whole of the torrid zone on the one hand, and of the frigid zone on the other. But it could easily be shewn, by calculation, that if the heat of the sun in these different countries were allowed merely to accumulate where it is received, or only to penetrate gradually through the unconducting mass of the earth, that while the cold of the higher latitudes would sink far below any thing hitherto experienced, the heat under the equator would, on the other hand, become quite unsupportable. The action of the atmosphere, therefore, forms a wise provision of nature to correct this inequality; and its powerful influence may be estimated by the happier distribution of heat which we actually enjoy. Far from producing perfect equality, however, we still discern with distinctness through all its effects, a gradation of climate from the equator to the poles depending essentially on the operation of the other law of nature, which being founded on the unchangeable figure and constitution of the globe itself, we may be assured that no ordinary power would be sufficient to overrule. When we see this great principle, therefore, to which every part of the earth's surface, the poles equally with the equator, is subject—when we see it by experience, moulding the climate of different regions, according to a law which is entirely agreeable to our deductions; when we find this perfect coincidence between theory and observation over the greater part of the globe, where exact experiments have been made; it is certainly not very reasonable, and would seem at variance with the established harmony of our system, to suppose that this principle should relax its efficacy in that inaccessible, yet, in point of extent, extremely inconsiderable region which the adventurous mariner has hitherto been unable to reach. The action of the sun, though less intense, is, without doubt, of the same nature at the pole as at the equator, and the atmosphere possesses the same qualities; it has the same effect upon the barometer, and the boisterous nature of the climate

manifests its unceasing operation in transporting hither the heat as well as the air of the higher latitudes, and mitigating, in no small degree, the natural inclemency of these desolate regions by this infusion of the warmth of happier climes. We are at a loss, therefore, to conceive any principle which should thus alter the nature of the Arctic climate, or what combination of circumstances should produce that extreme severity to which Mr. Scoresby has taken such pains to reduce it. We are far from meaning to oppose theory to the results of actual observation. But, for the above reasons, which we have taken the liberty to state at such length as the importance of the subject seems to demand, we cannot help thinking that the observations brought forward, though we again repeat we do not question their accuracy, nor are we either insensible of their value, are yet far from being sufficiently extensive to authorise the conclusion, that within the Arctic circle the operations of nature are carried on by a process different from that which prevails over the rest of the globe.

The law of climate, we may remark, was discovered, as is well known, by Mayer of Gottingen, from a comparison of meteorological observations; and although it may be far from representing, as we are perfectly aware, all the inequalities arising from local and disturbing causes; yet when we consider that all the observations hitherto made in different parts of the world coincide with it on the whole to within a few degrees, and on the other hand, the very trifling amount of this error, compared with the vast scale of heat, each degree, at ordinary temperatures, not exceeding the 1400th part of what any body contains, and that therefore, even admitting all the discrepancies that have been urged, this law still fixes the climate of different latitudes to the 500th part of the heat they contain—that it enables us, merely knowing the latitude, to anticipate with that degree of precision, not only the mean heat of any one place, but of a whole zone of the earth's surface, comprehending at a medium upwards of a million of square miles, such an agreement must certainly be deemed surprising and satisfactory, and indicates at any rate the predominating action of the above general laws in a manner quite sufficient for the present argument, since the temperature of the pole is meant to be reduced no fewer than 20°.

But the valuable experiments on the temperature of sea-water, made by Mr. Scoresby himself, and which, though they occur in a preceding chapter, we have preferred noticing here, seem to afford a direct proof that these speculations, so inconsistent with theory, are equally at variance with fact. It is well known, that when we dig into the ground, or examine the

springs which issue from the bowels of the earth, the vicissitudes of the seasons disappear in proportion as we descend, until we at last arrive at a permanent degree of heat which corresponds to the mean temperature of the place of observation. But the same thing must happen in the Arctic seas, where the water, from its low temperature, loses, in a great measure, its quality of expanding and contracting by the additions of heat and cold, and where the impression of the solar heat, therefore, received at the surface, must be conducted downwards nearly in the same manner as through the more solid matter of the earth; at a certain depth below the surface, then, we should here also expect the same permanent degree of heat, and that from this point it should continue unaltered to the bottom. The above experiments concur with others that have been already made to confirm this idea, and afford, we think, one of the most conclusive arguments in favour of the views we have been endeavouring to illustrate.

As these experiments are among the most valuable in the book, we shall give them nearly entire; and, considering how few opportunities occur of obtaining similar observations, and still more how few individuals, to whom the opportunity offers, are qualified by their attainments, or their love of knowledge, to execute them with such effect, men of science will, no doubt, feel due obligation to this enterprising and meritorious navigator, for these important records of the temperature of the Arctic seas. The experiments were made with the marine diver, which, with its included thermometer, was let down and taken up full of water, which could be let in at the desired depth.

On the 19th April, 1810, the ship being beset in ice in Lat. 76° 16′, Long. 9° 0′ E. the temperature of the surface of the water being 28° 8, at the depth of 300 feet it was 31° 8′, at 738 feet 33° 8′, and lastly at 1380 feet 33° 3′. On the 23d April, Lat. 76° 16′, Long. 10° 50′ E. and the ship frozen up, the temperature at the surface, and at the successive depths of 120, 300, and 738 feet, was successively 28° 3′, 28° 0′, 28° 3′, 30° 0′. On 23d April 1811, the ship frozen up in Lat. 76° 34′, Long. 10° 0′ E. the temperatures at the surface, and at 120, 240, 360, 600 feet, were respectively 30° 0′, 31° 0, 35° 0′, 34° 0′, 34° 7′; and on May 1, 1811, ship beset in ice Lat. 77° 15′, Long. 8° 10′ E. at the same depths, 29° 3′, 29° 3′, 29° 3′, 30° 0′, 30° 0′. On 20th May, 1813, Lat. 77° 40′, Long. 2° 30′ E. depths 0, 300, and 660 feet, temperatures 29° 0′, 29° 3′, 31° 0′. On 20th May, 1816, Lat. 79° 0′, Long. 5° 40′ E. ship moored to a floe, depths 0, 78, 222, 342, 600, 2400, temperatures 29° 0′, 31° 0′, 33° 8′, 34° 5, 36° 0′, 36° 0′. On 21st May, 1816, Lat. 79° 4. Long. 5° 38′, E.

depths 0, 4380 feet, temperatures 29° 0′, 37° 0′. 7th June, 1816, Lat. 80° 0′, Long. 5° 0′ E. depths 0, 720 feet, temperatures 29° 7′, 36° 3′. Lastly, on 7th June, 1817, Lat. 78° 2′, Long. 0° 10′ W., the temperature at the surface being 32° 0′; at the vast depth of 4566 feet it was 38° 0′. This remarkable warmth of the Arctic abyss, Mr. Scoresby ascribes to an under current from warmer latitudes, but of its existence, though extremely improbable, he offers no proof, and suppose even the heat to arise from this quarter, it would still extend its meliorating effect to the surface.

From the other sections of this chapter, we have only room for an extract, on the effects produced by cold, which cannot fail to produce feelings of sympathy for the sufferings to which our seamen are often exposed, whilst engaged in the whale-fishery.

"In the year 1814, when a temperature of zero occurred, we reached the latitude of 70°, without experiencing any cold below 30°; but in less than twenty-four hours, the thermometer fell 25°, and indicated a temperature of 5°. Thus, between the time of my leaving the deck at night, and arising the following morning, there was an increase in the cold of about 20°. This remarkable change was attended with singular effects. The circulation of the blood was accelerated,—a sense of parched dryness was excited in the nose,—the mouth, or rather lips, were contracted in all their dimensions, as by a sphincter, and the articulation of many words was rendered difficult and imperfect; indeed, every part of the body was more or less stimulated or disordered by the severity of the cold. The hands, if exposed, would have been frozen in a few minutes; and even the face could not have resisted the effects of a brisk wind, continued for any length of time. A piece of metal, when applied to the tongue, instantly adhered to it, and could not be removed without its retaining a portion of the skin; iron became brittle, and such as was at all of inferior quality, might be fractured by a blow; brandy of English manufacture, and wholesale strength, was frozen; quicksilver, by a single process, might have been consolidated; the sea, in some places, was in the act of freezing, and in others appeared to smoke, and produced, in the formation of *frost-rime*, an obscurity greater than that of the thickest fog. The subtile principle of magnetism seemed to be, in some way or other, influenced by the frost; for the deck compasses became sluggish, or even motionless, while a cabin compass traversed with celerity. The ship became enveloped in ice; the bows, sides, and lower rigging were loaded; and the rudder, if not repeatedly freed, would, in a short time, have been rendered immoveable. A considerable swell at this time prevailing, the smoke in the cabin, with the doors closed, was so intolerable, that we were under the necessity of giving free admission to the external air to prevent it. The consequence was, that in front of a brisk fire, at the distance of a yard and a half from it, the temperature was 25°; water spilt on the table froze, and, indeed,

congelation took place, in one situation, at the distance of only two feet from the stove. Hoar-frost also appeared in the sailors' bed-cabins, arising from their breath, and was deposited upon their blankets." Ib. p. 330, &c.

Chapter sixth, on the Zoology of the Arctic Regions, is not intended as a systematic Fauna Arctica, but merely as a sketch of such a work, and consists chiefly of original observations on a few of the more remarkable animals which frequent Spitzbergen and the adjacent seas, and which have not, in Mr. Scoresby's opinion, been well described previously. He candidly acknowledges, that of some animals occasionally met with in these regions, though he may have seen them more than once, he was not able to ascertain the genus. These are of the cetaceous kind, the distinguishing characters of some of which are still but imperfectly known. After the length to which we have already extended, we find it necessary to confine ourselves to a brief notice of the more important particulars respecting the whale, as preparatory to the account we mean to give of the second volume, which, as already mentioned, is occupied in the history of the operations for the capture of that valuable animal.

The average size of common whales (that is the Balæna Mysticetus) is estimated by Mr. Scoresby, who has been personally concerned in the capture of 322 of them, at 60 feet. He is decidedly of opinion that they have been often overrated, especially by some of the older writers; and he thinks that the notion of their having diminished in size, since the commencement of the fishery, is erroneous. Cetaceous animals of greater dimensions have undoubtedly been met with; but these, it is highly probable, were generally individuals of other species, as the Balæna Physalis, or the Balæna Musculus, which are well known to exceed the common whale in length. The longest *actual* measurement of this last, which Mr. Scoresby has met with, is given by Giesecké, and amounted to 67 feet, whereas the well ascertained length of the Physalis may be stated at 100 feet, and examples have frequently been noticed of a larger size. The greatest circumference of the common whale, which is a little behind the fins, or in the middle, is from 30 to 40 feet. Its form is cylindrical from the neck to within ten feet from the tail, where it becomes quadrangular. The head is somewhat triangular. The mouth, when opened, is so large as to be able to contain "a merchant-ship's jolly-boat full of men;" and its tongue, which occupies a large proportion of this cavity, is very strikingly described in a popular book, as about the size of a feather-bed. In place of teeth, the mouth has two rows of "fins," or whalebone, as it is usually called, which are suspended from the sides of the "crown-bone," or

skull, and which vary from 10 to 15 feet in length, and are about 10 or 12 inches at their greatest breadth. These give an arched form to the roof of the mouth, and at their lowest extremities enclose the tongue, which is so fixed throughout as to be incapable of protrusion. The eyes, which are very small in proportion to the size of the animal, not being much larger than those of an ox, are placed in the sides of the head, about a foot above and behind the angle of the mouth. No external ear is discernible in the whale, and it is only after removing the skin that it is found to possess an auditory organ. On the highest part of the head, about 16 feet from the anterior extremity of the jaw, are situate the blow-holes or spiracles, which form the proper nostrils of the animal. Both jaws have a few short scattered hairs, which may be reckoned the beard. The throat is very strait. Two fins, which are all that the common whale possesses, are placed laterally between one-third and two-fifths of the length of the animal, from the snout, and about two feet behind the angle of the mouth, and are from 7 to 9 feet long, 4 or 5 broad. They are capable of very free motion, but cannot be raised above their horizontal position; so that the notion of the whale supporting its young on its back, by means of its fins, is quite erroneous. The tail comprises from 80 to 100 square feet of surface, and is remarkable for the rapidity and freedom of its motions, and its immense strength. It is placed horizontally, being from 18 to 26 feet wide, but only 5 or 6 feet long; and is of a flat semi-lunar shape, somewhat indented in the middle, so that its two lobes point a little backwards. The paps of the female are two in number, and are placed on the lower part of the belly; and the milk which they yield, when the animal gives suck, resembles that of quadrupeds, and is said to be well-flavoured. In respect to colour, the whale is sometimes of a velvet-black, grey, white with a tinge of yellow, and occasionally piebald all over. Generally speaking, the older the animal is, the greyer or whiter it becomes. Those that are not full grown, are of a bluish-black; and the suckers, or sucklings, are of a pale bluish or a bluish-grey colour. Beneath the skin, which is slightly furrowed on the body, but smooth on the tail and fins, lies what is called the *blubber* or fat, whence the oil, for which the animal is chiefly taken, is derived. This varies in thickness, in different parts and in different individuals, from 8 to 20 inches; and in colour is usually either of a yellowish white, or approaching to that of the salmon. In its recent state the blubber is perfectly free from unpleasant smell. The flesh of the whale, when young, does not eat unlike coarse beef; that of the older animals is "exceedingly coarse." The palate of the Esquimaux is well known

to be gratified by the flesh, fat, and oil of the whale; and it is matter of history that, in former times, several people of Europe did not dislike to eat of this creature. The bones are mostly very porous, and contain large quantities of fine oil. The jaw-bones, which also yield oil, measure from 20 to 25 feet in length. A whale 60 feet in length will weigh 70 tons, about 30 of which are blubber. "Four tons of blubber by measure generally af-"ford three tons of oil*; but the blubber of a sucker contains "a very small proportion. Whales have been caught that af-"forded nearly thirty tons of pure oil; and whales yielding "twenty tons of oil are by no means uncommon. The quantity "of oil yielded by a whale generally bears a certain proportion "to the length of its longest blade of whalebone."

Whales are dull of hearing; but their sense of sight is acute, especially in water. They have no voice, but make a noise when they breathe, or *blow*, as it is usually called, which they do about four or five times a-minute, on coming up for that purpose. This is rarely continued above two minutes at a time. As they are somewhat lighter than the water, they can remain at the surface of the sea, and in this case generally expose about a twentieth part of their bulk. It is chiefly by means of their tails that they perform the operation of swimming, which they rarely do beyond the rate of four miles an hour when not pursued, but which they can quicken to eight or nine, if enraged or alarmed. This greater rate, however, is only of short continuance, and relaxes to almost one-half. They have been known to descend in the water to the depth of 400 fathoms, with the velocity of seven or eight miles an hour; and the rapidity of their ascent, which it will be easily understood, must be much greater, is frequently such that they leap entirely out of the water.

"This feat they sometimes perform as an amusement apparently, to the high admiration of the distant spectator; but to the no small terror of the unexperienced fishers, who, even under such circumstances, are often ordered by the fool-hardy harpooner, to 'pull away' to the attack. Sometimes the whales throw themselves into a perpendicular posture, with their heads downward, and, rearing their tails on high in the air, beat the water with awful violence. In both these cases the sea is thrown into foam, and the air filled with vapours; the noise, in calm weather, is heard to a great distance; and the concentric waves produced by the concussions on the water are communicated abroad to a considerable extent. Sometimes the whale shakes its tremendous tail in the air, which, cracking like a whip, resounds to the distance of two or three miles. When it retires from the surface, it first lifts its head, then plunging it under water, elevates its back like the segment of a sphere, deliberately rounds it away towards the extremity, throws its tail out of the water, and then disappears.

* The ton or tun of oil is 252 gallons of wine measure.

"The depth to which they commonly descend is not known, though from the 'eddy' occasionally observed in the water, it is evidently, at times, only trifling. But when struck, the quantity of line they sometimes take out of the boats, in a perpendicular descent, affords a good measure of the depth. By this rule, they have been known to descend to the depth of an English mile; and with such velocity that instances have occurred in which whales have been drawn up by the line attached, from a depth of 700 or 800 fathoms, and have been found to have broken their jaw-bones, and sometimes crown-bone, by the blow struck against the bottom." Ib. p. 467, &c.

The period of gestation of the female is supposed to be about nine or ten months; and it rarely brings forth more at a time than one cub, which is from 10 to 14 feet in length, and which goes under protection of the mother for probably a-year. The maternal affection is highly interesting, and often gives rise to both painful feelings and danger to the fishers. The whale attains its full growth at the period of from 20 to 25 years, and undoubtedly lives to a great age, which is indicated by an encrease of grey colour, a change to a yellowish tinge of the white parts about the head, a decrease in the product of oil, and a greater hardness of the blubber. Though often found in great numbers together, when attracted by food, it can scarcely be called a gregarious animal, as it is most generally found solitary or in pairs. The male sex is supposed to be more numerous than the female. These animals abound most in the frozen seas of Greenland and Davis' Strait—in the Bays of Baffin and Hudson—in the sea to the northward of Behring's Strait, along some parts of the north coast of Asia, and probably that of America; they are never met with in the German Ocean, very rarely within 200 leagues of the British coast, but not unfrequently along the coasts of Africa and South America, where they are often covered with the shell-fish called barnacles, from which those of the Arctic seas are free. The B. *physalis*, or *razor-back whale*, formerly alluded to as much larger than the common whale, and which also yields oil, as do all the cetacea, is a more active and spirited animal; it is with greater difficulty intimidated or subdued; and therefore, though often mistaken for the mysticetus, is a far less eligible object for the fishers. The B. *musculus*, or *broad-nosed whale*, bears a considerable resemblance to the physalis, but, besides other distinctions, is shorter, and has a larger head in proportion. These are the only members of the family which we think it worth while to notice in the present sketch.

The Second Volume commences with an historical account, from the most early period down to the present time, of the Greenland and Davis' Straits whale fishery. For an obvious rea-

son, we cannot enter into a lengthened consideration of this portion of the work, and we shall therefore confine our remarks chiefly to those which concern England and Holland, the two great rival nations in the Greenland trade. The exact period when the English first embarked in the whale fishery, is not distinctly ascertained, but the probability is, that the town of Hull had the honour of precedence, by fitting out several vessels for the purpose, between 1594 and 1598, not quite half a century after the discovery of Greenland by Willoughby. About the year 1616 the Russian company, who had hitherto engaged in an unsuccessful monopoly of the Greenland trade, was joined by the East-India company, with a joint capital of £120,000. This united company, however, after making several unprosperous voyages, was again disunited in 1620. Four members of the Russian company then took up the trade on their own account, and sent out seven ships that year, eight in 1620, and nine in 1621, which procured in three years 3100 tons of oil. From this period till 1786, notwithstanding the continual support and encouragement of Government, who granted charters to companies, and allowed bounties from 20s. to 40s. *per* ton to stimulate individuals inclined to adventure in the trade, the Greenland whale-fishing languished and decayed, or at least never attained eminence or stability, in a national point of view, compared to that which the Dutch then enjoyed. As an instance, we may just observe, that whilst the English South Sea Joint-Stock Company, into whose hands this fishery had fallen, sunk a capital of L.82,000, the Dutch, in the course of ten years, included between 1699 and 1708, equipped 1652 ships, which caught 8537 whales; the produce whereof sold for 26,385,120 florins, of which the sum of 4,727,120 florins was clear gain. We may also state, in farther illustration of this fact, that, "from the year 1715 to 1721, "one year with another, 150 tons of whale-bone were imported "yearly into London only; even when the price was £400 *per* "*ton.* The whale-bone, which was at the same time imported "into other parts of Great Britain and Ireland, may, at a moderate estimation, be supposed to be 100 tons more; the value "of which, £100,000, was annually paid to foreigners for "whalebone at this period."

By accounts laid before Parliament in the year 1786, it appeared, that the bounties granted for the encouragement of the Greenland and Davis' Straits whale-fishery, from the year 1733, when bounties were first given, to the end of 1785, had amounted to £1,064,272, 18s. 2d. for England, and £202,158, 16s. 11d. for Scotland. From this period, when the bounty was reduced to 30s. *per* ton, the Greenland and Davis' Straits whale-fishery has continued to flourish beyond all example, and has

fairly driven the Dutch out of the Greenland seas. In 1792, the bounty was reduced to 25s. *per* ton, and in 1795, to 20s. *per* ton, at which latter rate it has continued ever since, without producing diminution of tonnage. "From the year 1810 to 1818 inclusive, 824 ships sailed from England to the whale fisheries of "Greenland and Davis Straits, and 361 from Scotland. In the "four years ending with 1817, 392 vessels sailed from England "to these northern fisheries, the amount of whose cargoes was "3348 whales, besides seals, narwhales, bears, and sea-horses; "and the produce 35,824 tons of oil and about 1806 tons of "whale-bone, together with a quantity of skins. From Scot-"land, there sailed in the course of the same period, 194 vessels "to the whale fisheries, the amount of whose cargoes was 1682 "whales, &c. and the produce 18,684 tons of oil, and about "891 tons of whale-bone, besides skins." In 1814, the Greenland whale-ships were uncommonly successful; "76 ships," says our author, "procured 1437 whales, besides seals, &c. the "produce of which, in oil only, was 12,132 tons, being an "average of $18\frac{9}{10}$ fish, or 159.6 tons of oil *per* ship. The average "fishery of Davis' Straits the same season, was about one-third "less *per* ship. The gross value of the freights of the British "Greenland and Davis' Straits fleets, bounties included, estimating the oil at £32 per ton, and the whale-bone at £80 per ton, "exceeded in this one year £700,000.—In the five years ending "with 1818," he continues, p. 122, "about 68,940 tons of oil, and "3420 tons of whale-bone, of British fishing, have been imported "into England and Scotland. If we calculate the oil at £36, "10s. *per* ton, and the whale-bone at £90 *per* ton, about "the average price, and add to the amount £10,000, for the "probable value of the skins, and other articles—the gross value of goods imported into Britain from Greenland and "Davis' Straits in five years, free of first cost, will appear to "have been near three millions Sterling." The greatest cargo ever brought into Great Britain in one vessel from the whale-fishery, was procured near Spitzbergen, by Captain Souter, in the Resolution of Peterhead, in 1814. It consisted of 44 whales, the gross value of which, including the bounty, was about £11,000. In the previous year, the John of Greenock, commanded by our author's father, made above £11,000 freight; and the cargo of the Esk of Whitby, commanded by our author himself, sold for near the same sum.

Various opinions have been formed as to the causes which produced the almost universal failure of the English in the whale fishery, up to a late period, and the general good success of the Dutch; but the fact, we apprehend, is simply this,—that the merchants, inexperienced in a trade that had foiled the knowledge,

skill, and capital of the great Russian, East Indian, and South Sea Companies, into whose hands it had hitherto been chiefly confined, entertained the idea, that it never could be entered into with any reasonable prospect of success by individuals; they were ignorant of the ruinous system by which all great companies are managed, of the frugality consequent on individual speculations—and, they neither knew nor inquired into the methods by which the Dutch whale-fishery was so profitably conducted. Other circumstances, by no means of a doubtful nature, may have co-operated,—a deficiency in the qualifications of the persons commanding the ships—unskilfulness of the crews—want of perseverance and confidence—their energies being ill applied, or imperfectly followed up. Monopoly, however, may be considered as the chief cause; no commercial nation can possibly flourish, when her commerce is monopolized by a few chartered companies. The Dutch themselves, at one period of the whale fishery, experienced this truth in a remarkable degree. Insensible to the advantages arising from freedom in commerce, the Dutch government allowed the whole trade to become the exclusive property of a chartered company; the consequence was, that, in a few years, the number of ships sent annually thither was reduced from 160 to 30; but shortly after the trade was again laid entirely open, it was augmented ten-fold.

In the early days of the whale-fishery, after the fears which mankind naturally entertained, on the contemplation of so prodigious an animal, were dissipated by the important discovery of its comparative inoffensiveness and timidity, there was little difficulty experienced in finding it in its ascertained haunts, or even of subjecting it to capture. The whales, unconscious of danger, and accustomed to sport at liberty in their native domain, suffered themselves to be approached, without an effort to escape, and thus presented the fairest opportunities for the murderous attacks of their pursuers. As they were then abundant in the bays, (as, for example, of Spitzbergen), it was customary for the fishers to bring their ships to an anchor at some convevenient place, where they remained moored till their cargoes were completed. The blubber was usually taken on shore, and there subjected to the various processes required in order to procure the oil which it contained; and while a part of the crew was thus engaged, the rest employed themselves in the capture of other whales. Between the years 1630 and 1640, these animals, having at length become alarmed by the frequent and annoying visits of their enemies, receded from their former situations; but as they still continued in the vicinity of the coasts, the only change that was found necessary in carrying on the fishery, was

to send the boats out of the bays in search of them, and to tow them into harbour when captured. This plan, however advantageous for a time, was at length given up, as the increasing distance of the whales, owing to such persevering hostility, required the ships to keep out at sea, and attack their prey wherever they could fall in with it. An entire revolution in the management of the fishery now took place; much more alertness and nautical skill were needed to guard against misfortunes and to secure a cargo; and those buildings which had formerly been erected on shore, for the purpose of extracting the oil, were rendered useless, as the additional time demanded for the operations in the open sea rarely or never allowed leisure to land. The blubber was henceforth packed in casks and conveyed home. Sundry corresponding alterations were accordingly effected in the construction of the ships, as well as in the quality and quantity of the fishing apparatus. The following extract will shew the peculiarities of the chief stations now resorted to.

"Davis' Straits, or the sea lying between the west side of *Old* Greenland and the east side of North America, and its most northern islands, has generally, since the close of the 17th century, been the scene of an advantageous whale-fishery. This fishery was first attempted by the Dutch in 1719; after which period, it was usually resorted to by about three-tenths of their whalers, while seven-tenths proceeded to Spitzbergen. The whale-fishery of Davis' Straits, is conducted in an extensive limit, and differs only from that of Spitzbergen, or Greenland, in the sea being in many districts less incommoded with ice, and in the climate, on account of its lower latitude, or the influence of the land in receiving and dispersing the heat derived from the sun, being somewhat more mild. The alterations which have taken place in this fishery, are in some measure similar to what have occurred at Spitzbergen. The fish, which half a century ago, appear to have resorted to all parts of the western coast of *Old* Greenland, in a few years retired to the northward, but they still remained about the coast. Within a very few years, however, of the present, they deserted some of the northern bays in which they used to be captured in considerable abundance, and have of late been principally caught in icy situations, in a high latitude, or in the opening of Hudson's Straits, or at the borders of the western ice near the coast of Labrador. Baffin's Bay was suggested as an excellent fishing station, by the voyager whose name it bears, so early as the year 1616, when his memorable navigation was performed.—To this situation, where the whales have never been molested, until two years ago, it appears they still resort in the same manner, and in similar numbers, as in the time of Baffin. In 1817, two or three of the Davis' Straits whalers proceeded through the Straits into Baffin's Bay, to a much greater length than they were in the habit of adventuring; where, in the month of July and August, they found the sea clear of ice, and in some parts abounding with whales. A Leith ship, which it ap-

pears advanced the farthest, made a successful fishery, in latitude 76°—77°, after the season when it was usual for ships to depart. This fact having become generally known, several other ships followed the example in the last season, (1818,) and persevered through the barriers of ice lying in 74°—75° towards the north. After they had succeeded in passing this barrier, they found, as in the preceding year, a navigable sea, where several ships met with considerable success in the fishery, at a very advanced period of the season. This discovery, therefore, of the practicability of pursuing the whales to their most northern retreats, and thus prolonging the fishery to a much later period than was before usual, is likely to prove an era of great importance in the fishery of Davis' Straits. Ships which fail of success in the old stations, will still, in the new fishery, have a reserve of the most promising character. And instead of the fishery being terminated by the disappearance of the whales from the old stations, it is probable it will in future be only terminated by the setting in of the frost. There is rarely any thick ice formed in June, though the sea be constantly at or near the freezing temperature; much less will there be a liability to strong ice being formed in September, which is but three and a-half degrees colder than June, when the sea has had the effect of the warmth of two months, during which the mean temperature of the air is usually from 6° to 9° above the freezing point of sea-water. Hence, instead of this fishery being necessarily closed in July, the period when the whales have usually made their final retreat from the old fishing stations, it will in future be extended to the end of August at least; and it may ultimately appear, that there will be little danger of ships being permanently frozen up, unless previously beset in the ice, during any part of the month of September." Vol. II. p. 182, &c.

The mode of fishing that is now used, does not vary considerably from what was practised a century ago, the chief improvements consisting rather in an increase of application, perseverance and activity, than in the adoption of new or greatly modified contrivances. The instruments of general use are, the harpoon and the lance. The former, which is made of iron, is about three feet in length, and consists of three conjoined parts, called the "socket," "shank," and "mouth," which last includes the barbs or "withers." This is the instrument by which the whale is first struck. It is so constructed as not to be easily withdrawn or expelled from the blubber or flesh of the animal, either by the strain of the lines which are attached to one of its extremities, or by the violent convulsive motions of the fish. The lance is a spear of iron, generally about six feet long, and is commonly employed to accelerate the death of the whale after the debilitating operation of harpooning. Lines, boats and oars, in addition to these two instruments, are all that are essential to the capture. At various periods, indeed, what is called a harpoon-gun has been employed, in order to

propel the harpoon to a greater distance than can be effected by the hand. It is found to be particularly serviceable in calm clear weather, but, notwithstanding sundry improvements which it has undergone, is neither in common use nor very easily managed. Various subsidiary implements are carefully and conveniently placed on board the boats engaged in the capture, and the crew is divided and arranged so as to give most assistance when required, and to guard against danger. Into the minutiæ of this part of the subject we shall not enter; but as nothing can surpass the cool and determined intrepidity of the whale fishers during the encounter, we think the following extract, which shows the ordinary procedure, cannot be unacceptable to our readers.

"Whenever a whale lies on the surface of the water, unconscious of the approach of its enemies, the hardy fisher rows directly upon it; and in an instant before the boat touches it, buries his harpoon in its back. But if, while the boat is yet at a little distance, the whale should indicate its intention of diving, by lifting its head above its common level, and then plunging it under water, and raising its body, until it appear like the large segment of a sphere,—the harpoon is thrown from the hand, or fired from a gun, the former of which, when skilfully practised, is efficient at the distance of eight or ten yards, and the latter at the distance of thirty yards, or upward. The wounded whale, in the surprise and agony of the moment, makes a convulsive effect to escape. Then is the moment of danger. The boat is subjected to the most violent blows from its head, or its fins, but particularly from its ponderous tail, which sometimes sweeps the air with such tremendous fury, that both boat and men are exposed to one common destruction.

"The moment that the wounded whale disappears, or leaves the boat, a jack or flag, elevated on a staff, is displayed; on sight of which, those on watch in the ship give the alarm, by stamping on the deck, accompanied by a simultaneous and continued shout of "a fall." At the sound of this, the sleeping men are roused, jump from their beds, rush upon the deck, with their clothes tied by a string in their hands, and crowd into the boats. With a temperature of zero, should a *fall* occur, the crew would appear upon deck, shielded only by their drawers, stockings, and shirts, or other habiliments in which they sleep. They generally contrive to dress themselves, in part at least, as the boats are lowered down; but sometimes they push off in the state in which they rise from their beds, row away towards the 'fast boat,' and have no opportunity of clothing themselves for a length of time afterwards. The alarum of 'a fall,' has a singular effect on the feelings of a sleeping person, unaccustomed to the whale-fishing business. It has often been mistaken as a cry of distress. A landsman, in a Hull ship, seeing the crew, on an occasion of a fall, rush upon deck, with their clothes in their hands, and leap into the boat, when there was no appearance of danger, thought the men were all mad; but, with another individual, the effect was totally different. Alarmed with the extraordinary noise; and still more so when he reached the

deck, with the appearance of all the crew seated in the boats in their shirts, he imagined the ship was sinking. He therefore endeavoured to get into a boat himself, but every one of them being fully manned, he was always repulsed. After several fruitless endeavours to gain a place among his comrades, he cried out, with feelings of evident distress, 'What shall I do? Will none of you take me in?'

"The first effort of a "fast fish," or whale that has been struck, is to escape from the boat, by sinking under water. After this, it pursues its course directly downward, or re-appears at a little distance, and swims with great celerity, near the surface of the water, towards any neighbouring ice, among which it may obtain an imaginary shelter; or it returns instantly to the surface, and gives evidence of its agony, by the most convulsive throes, in which its fins and tail are alternately displayed in the air, and dashed into the water with tremendous violence. The former behaviour, however, that is, to dive towards the bottom of the sea, is so frequent, in comparison of any other, that it may be considered as the general conduct of a fast fish.

"A whale struck near the edge of any large sheet of ice, and passing underneath it, will sometimes run the whole of the lines out of one boat, in the space of eight or ten minutes of time. This being the case, when the "fast-boat" is at a distance, both from the ship, and any other boat, it frequently happens, that the lines are all withdrawn before assistance arrive, and with the fish, entirely lost. In some cases, however, they are recovered. To retard, therefore, as much as possible, the flight of the whale, it is usual for the harpooner who strikes it, to cast one, two, or more turns of the line round a kind of post called a *bollard;* which is fixed within ten or twelve inches of the stern of the boat for the purpose. Such is the friction of the line, when running round the bollard, that it frequently envelops the harpooner in smoke; and, if the wood were not repeatedly wetted, would probably set fire to the boat. The utmost care and attention are requisite, on the part of every person in the boat, when the lines are running out; fatal consequences having been sometimes produced by the most trifling neglect. When the line happens to 'run foul,' and cannot be cleared on the instant, it sometimes draws the boat under water; on which, if no auxiliary boat, or convenient piece of ice be at hand, the crew are plunged into the sea, and are obliged to trust to the buoyancy of their oars, or to their skill in swimming, for supporting themselves on the surface. By the motions of the 'fast-boat,' the simultaneous movements of the whale are estimated. The auxiliary boats accordingly take their stations about the situations where the whale, from these motions, may reasonably be expected to appear.

"The average stay under water of a wounded whale, which steadily descends after being struck, according to the most usual conduct of the animal, is about 30 minutes. The longest stay I ever observed was 56 minutes; but in shallow water, I have been informed, it has sometimes been known to remain an hour and a half at the bottom after being struck, and yet has returned to the surface alive. The greater velocity, the more considerable the distance to which it descends, and the longer time it remains under water, so much greater in

proportion is the extent of its exhaustion, and the consequent facility of accomplishing its capture. Immediately that it re-appears, the assisting boats make for the place with their utmost speed, and, as they reach it, each harpooner plunges his harpoon into its back, to the amount of three, four, or more, according to the size of the whale, and the nature of the situation. Most frequently, however, it descends for a few minutes after receiving the second harpoon, and obliges the other boats to await its return to the surface, before any further attack can be made. It is afterwards actively plied with lances, which are thrust into its body, aiming at its vitals. At length, when exhausted by numerous wounds, and the loss of blood, which flows from the huge animal in copious streams, it indicates the approach of its dissolution, by discharging from its 'blow-holes,' a mixture of blood, along with the air and mucus which it usually expires, and finally jets of blood alone. The sea, to a great extent around, is dyed with its blood; and, the ice, boats, and men are sometimes drenched with the same. Its track is likewise marked by a broad pellicle of oil, which exudes from its wounds, and appears on the surface of the sea. Its final capture is sometimes preceded by a convulsive and energetic struggle, in which its tail, reared, whirled, and violently jerked in the air, resounds to the distance of miles. In dying, it turns on its back, or on its side; which joyful circumstance is announced by the capturers with the striking of their flags, accompanied with three lively huzzas." Ib. p. 241, &c.

The average length of time occupied in the capture of a whale, may be stated as not exceeding an hour. We find, however, among our author's "Anecdotes illustrative of peculiarities in the Whale Fishery," that the surprising strength and vigour of some whales have enabled them to make their escape, notwithstanding the combined efforts of the whole crew, after having been struck 30 hours; and one instance, in particular, which took place on board the Royal Bounty of Leith, in May 1817, which mentions the capture of a fish which survived 48 hours after being struck. The remarkable exhaustion of the animal on its first appearance at the surface, after having been harpooned, Mr. Scoresby observes, does not depend on the nature of the wound inflicted on it, which, comparatively speaking, is very inconsiderable. It is chiefly occasioned by the immense pressure to which the whale is subjected in its descent towards the bottom of the sea. We formerly directed attention to this subject, when mentioning some curious experiments instituted by our author. Here we cannot avoid quoting a short passage, which furnishes a very striking illustration.

"The surface of the body of a large whale, may be considered as comprising an area of 1540 square feet. This, under the common weight of the atmosphere only, must sustain a pressure of 3,104,640 lb. or 1386 tons. But, at the depth of 800 fathoms, where there is a column of water equal in weight to about 154 atmospheres, the

pressure on the animal must be equal to 211,200 tons. This is a degree of pressure, of which we can have but an imperfect conception. It may assist our comprehension, however, to be informed, that it exceeds in weight sixty of the largest ships of the British navy, when manned, provisioned, and fitted for a six months cruise." Ib. p. 249.

It only remains for us to say a few words on the general merits of this work. Our ideas of its importance are manifested by the largeness of our notice. Though it is very creditable to the author, and undoubtedly ought to find a place in all public libraries; yet, we think, that if he had confined it to a concise narrative of the observations and remarks he had himself made during his numerous voyages to the Greenland Seas, instead of swelling it out with treatise upon treatise on every subject, animate and inanimate, connected with the polar regions, extracted from Elking, Perrard, Churchill, De Reste, Pennant, Anderson, Macpherson, Barrow, and a whole host of other compilers,—it would have been rendered still more useful, without suffering loss of interest by the abridgment. This opinion, with our objection to some unnecessary minuteness and prolixity, does not hinder us from commending it, as having furnished by far the most accurate and satisfactory account that has ever been given to the public, of the varied peculiarities of the Arctic regions.

ART. II. *Travels in the Interior of Africa, to the Sources of the Senegal and Gambia; performed by command of the French Government, in the year* 1818. By G. Mollien; edited by T. E. Bowdich, Esq. Conductor of the Mission to Ashantee. London. Colburn and Co. 1820. Pp. 390. 4to.

UNTIL of late years that portion of western Africa which is comprehended between the 8th and 20th degrees of north latitude was but little known to Europeans. They had settlements, indeed, scattered over different parts of the country, and had ascended the Senegal and the Gambia as far as they were navigable, *i. e.* to the cataracts; but it does not appear that they had any accurate information of the interior, or that they had ever visited any of the great inland commercial cities. All the knowledge which they possessed of this great continent was derived from the reports of negro traders, chiefly intent on their own business, and on whom, therefore, little reliance could be placed for any other species of information. The interesting journeys of modern travellers, more especially those of the lamented Park,

have contributed, in some degree, to dispel this darkness, and to throw at least a partial light on the geography and commerce of this part of Africa. They have also kindled throughout Europe a passion for inland discovery, under the influence of which new adventurers still crowd to the field of generous enterprise; and although it is to be feared that many of them will perish in the arduous service in which they are engaged, there is little doubt that, sooner or later, some fortunate adventurer will gain the prize for which others have toiled in vain.

The author of the present work, Mr. Mollien, belonged to the crew of the French frigate the Medusa, which suffered shipwreck on the western shore of Africa, to the south of Cape Blanco, and he was one of those who took to the boat, and escaped to the shore without any accident. He crossed part of the great Desert of Sahara with his companions, in a southern direction; and after suffering great hardships, he arrived at the French settlements on the Senegal. Neither the fatigues and dangers which he encountered could extinguish in his mind the ardent desire which had been kindled for penetrating farther into the country, and M. Fleuriau, the French governor of the colony, approving of the plan which he presented for this purpose, and, possessing himself an ardent desire for discoveries in the unknown regions of the interior, authorised him to make preparations for his intended expedition. These, our author informs us, were on a moderate scale. Not deeming it prudent to carry with him merchandise to such an amount as might tempt the natives to plunder him, he contented himself with taking from the government stores two double-barrelled guns, ten pounds of powder, 50 gun-flints, 50 musquet-balls, three pounds and a half of coral, two pounds and two ounces of amber, 18 packets of beads, 14 pounds of tobacco, 1 hatchet and 1-3 of a yard of scarlet cloth. He was also provided with a blanket, two leathern bottles for water, a powder-horn, and a portmanteau, two daggers at his side, and three pocket compasses. His baggage was carried by an ass, and he was accompanied by a Marabout, or religious person, named Diai Boukari, who acted as his interpreter, and received a salary of 180 francs per month. At the request of this man, his son was also taken along with him, and a young slave named Messember.

His general instructions were, that he should penetrate to the sources of the Senegal and the Gambia; and it was afterwards left to his own discretion whether he should attempt the more difficult enterprise of sailing down the Niger to its mouth. Mr. Mollien accomplished in part the object of these instructions; he visited the sources of the Senegal and the Gambia; and, in the

course of his journey, he appears to have displayed great intrepidity, temper, and perseverance, in braving the numerous dangers to which he was exposed, from the fatal effects of the climate, aggravated by incessant fatigue and hard fare, and from the cruel and perfidious character of the natives. The details of his journey are lively and amusing; the tract of country which he traversed appears to be populous and flourishing; and the account which he gives of its productions and climate, and of the commerce, character, and manners of its inhabitants, is plain and sensible, and agrees generally with the observations of Park, whose route, in his adventurous journey eastward, crossed that of our author.

On the 28th January, 1818, M. Mollien quitted the French colony; and having crossed the estuary of the Senegal, which here forms a peninsula on which the French settlement is situated, he arrived on the main land, at Diedde, a village of the country of Cayor, at ten o'clock, P.M. He travelled eastward over a country well peopled, and covered with villages and trading towns, several of them containing from 2 to 5000 inhabitants. In each of these towns, there is a chief who regulates their affairs, but who seems no way disposed to exercise his power to the oppression of the inhabitants. They are all exposed, however, to be plundered by the king of the district, or the Damel, who frequently gives them up to be pillaged by his licentious followers; at other times he sends his servants to lie in ambush for the inhabitants, who are kidnapped and sold for slaves. M. Mollien frequently met with the recent traces of ravage and cruelty;—villages laid desolate, and the inhabitants who remained, many of them wounded and perishing for want. At the formerly flourishing village of Kelkom, where indigo was industriously cultivated, and its colouring matter employed in the dying of cotton stuffs, he received, from some mutilated negroes who alone survived the outrages of the Damel's followers, a moving account of the miseries which they suffered. Several of their relatives, he observed, "had perished while resisting the sanguinary orders of their king;" but the greater part groaned in fetters; others, tranquil in their huts, and believing themselves at peace, had been sold for slaves without their knowledge.

"The sight of this desolate village, (says our author,) proved to me how unserviceable to humanity was the generous principle which actuated European philanthropists to accomplish the abolition of the slave trade. Can these negroes enjoy any happiness in their own country, under the yoke of princes who have power to tear them from their families and their country, or slaughter them at their pleasure?"

The hospitality exercised by the chiefs of the different villages

is unbounded; and it was the practice of M. Mollien, on his entrance into any of these, to wait immediately on the chief, who received him in the most friendly manner, and invited him to participate in his homely fare. At the village of Niakra, the chief Fali Loum received him not only with kindness, but with respect, and during the two days he remained here, he was overwhelmed with visits, the negroes of the neighbourhood flocking to the village to see a white man, and generally bringing provisions, which M. Mollien purchased in exchange for tobacco. His host refused compensation for his entertainment; on being presented with six musket-balls, six flints, and four heads of tobacco, besides some coral beads for his wife, he praised the liberality of our traveller in the most magnificent terms, and expressed his regret at the inadequate reception he had met with. In the neighbourhood of all these villages, there are wells which are often dug with incredible labour, to the depth of 30 and 36 fathoms. These wells are private property, and their proprietors allow no one to draw water from them without paying for it.

The country through which M. Mollien passed, is inhabited by the different races of the Negroes and Moors, who mutually hate each other, and he having assumed the Moorish dress when he set out, frequently experienced, on this account, an indifferent reception at the huts of the Negroes. He at length equipped himself in the European costume, and in this, his proper character, he was a much more acceptable guest to the natives. Wherever he went, however, his colour and long face were regarded with great curiosity, and generally with strong marks of aversion by the inhabitants. At the village of Coque, which contains about 5000 people—which is the great thoroughfare for the trading caravans of the Moors, and of which the streets are crowded with camels and oxen, he was surrounded by the inquisitive crowd while he was on his way to pay his respects to the chief. He would have returned; but found it too late. "There is a white man," was the general cry; and so eager was their curiosity, that they pushed against each other, clapping their hands, and crying out, "The white man for ever," while, from the intolerant Moors, the cry of "Down with the Christian," was distinctly heard by M. Mollien. The Negroes were greatly diverted at the length of his nose; his dress also particularly attracted their attention; one put his hands in his pocket; another looked with astonishment at the stitching of his shoes, and the thickness of their soles. To escape from their importunate curiosity, he was at length obliged to urge on his horse, whose movements having dispersed the crowd, he arrived at his hut. The chief sent him his dinner, and warned him, at

the same time, not to stir from his hut, apparently from an apprehension that some injury was intended him by the Moors. After so much disturbance during the day, he endeavoured to compose himself for rest at night. But his rest was disturbed by the following, as most of our readers will admit, very adequate cause.

"About the middle of the night, I was suddenly startled out of my sleep by the roaring of two lions, which were prowling about the village to seize an ox or a sheep. It was the first time I had heard this signal of carnage. I confess it made me shudder, and my companions were equally alarmed. The door of every hut was closed; mothers called in their children; the men heard in gloomy silence the voice of these terrible animals, which kept advancing. The dismay was general; nevertheless, some armed themselves. The dogs howled, they durst not, however, leap over the hedges which enclosed the courts. The oxen lowed, but their lowing was often interrupted by fear at every roar of the lion. The asses, the horses, in short every animal answered but in doleful accents the horrid roaring which they heard. Whether the lions carried off some victim into the recesses of the forests, or whether they retired without committing any havoc, we ceased to hear them, and the consternation which they had spread subsided." P. 45.

M. Mollien and his companion had now traversed the country eastward, for about 100 miles. It was mostly flat, and of a fertile soil, producing millet, the grain on which the inhabitants chiefly subsist, cotton and indigo in abundance. Horned cattle and sheep are numerous, and many of the natives subsist by pasture. Every village possesses a few artificers, such as blacksmiths, weavers, dyers, shoemakers, &c. The religion of the inhabitants is partly Pagan, and partly Mahometan. The Negroes, however, though they are rigid Mahometans, are not intolerant. It is the hatred of the fanatical Moors which the Christian traveller has chiefly to dread. Mahometanism, according to our author, is making daily progress, and will soon become the universal religion in this part of Africa. In their habits and mode of life, the inhabitants are extremely simple. Their huts are constructed of meshes only, and a door of straw is their only safeguard. Their walls are so slightly built, that people may converse through them. They are compactly put together, however, and most of them afford shelter from the rain. They are of a circular form, and at a distance have the appearance of beehives. Every man has two huts; one of them the Negro sleeps in, and the other serves for his kitchen. The furniture consists of a few mats, on which the family sleep, a cauldron of iron or earthen ware, a few calabashes, and a wooden mortar for pounding millet. Their dealings with each other are chiefly carried on by barter, in which cotton cloths and millet constitute the stand-

ard of value, and in most cases serve in place of money. But the traders who have visited the European settlements of St Louis and Goree, have learned the value of silver, in exchange for which only they agree to dispose of their cattle or horses to whites. The silver, which they carry into the interior, is converted into trinkets. The Negro weavers receive in exchange for their cotton cloths millet, and the blacksmiths are paid with cloths. Gold, amber, and coral, are given in exchange for slaves, and the latter are exchanged for horses and oxen.

When our author had penetrated about 100 miles further into the country, he changed his course to the south. In this part of his route, he was accompanied by a caravan of about sixty persons, including women and children. The Negroes travelled on foot, some driving their asses before them, laden with salt, cloths, and small millet, which they were carrying into the interior; others conducted herds of oxen, while some were on horseback. When the caravan entered the forest which separates the country of Foutatoro from that of the Bourb-Joloffs which they had left, the sun was below the horizon. They were marching quietly on, lighted by the moon, when suddenly, in the thickest part of the wood, they were appalled by the roaring of a lion, seemingly about 100 paces distant. "The silence," M. Mollien observes, "which instantly reigned throughout the troop, permitted us to hear very distinctly the movements of this terrific animal among the high grass which concealed him from our view."—"The effect of thunder," continues our author, "does not cause a more awful sensation than that which the alarming cry of the king of beasts produced on the whole caravan; women, children, all ran pell-mell for protection to the horsemen, with such precipitation that they overthrew each other." After this alarm, the caravan moved on with great speed; and they only stopped every six miles for half an hour at a time, during which they kindled large fires to keep off the wild beasts. The Negro fellow travellers of M. Mollien were extremely attentive to his comforts; and observing the scanty meals which he made, they frequently brought him small loaves of millet flour, and a little honey; and they all assembled near the fire where he slept, to prevent its being put out. What a contrast does such humane attention to an unprotected stranger present to the barbarous and unfeeling conduct of the Egyptian traders to the unfortunate Burckhardt, when he accompanied them in their journey southward accross the Nubian desert; and indeed what a contrast does it present generally to that degraded state of manners, and to that total want of moral principle which seems to prevail in all the commercial towns along the course of the Nile,

and also on the shores of the Red Sea, as well as generally throughout most parts of Northern Africa. All European travellers who have penetrated into these regions, concur in giving the most unfavourable report of the character of the people, who are represented as cruel, treacherous, ferocious, and selfish. A stranger is barely tolerated, and he may think himself fortunate if he escapes being robbed and murdered. There is no hospitality or kindness, nor is there any effective police to controul the bad dispositions of the people, and to give protection to life or property. In Western Africa, there appears to be a due admixture of good and evil in the character of the people; hospitality to strangers is exercised everywhere; and if the safety of the traveller is occasionally endangered by bad men, he meets with individuals of a different description, whose kindness and generosity retrieve the character of the people from the reproach of selfishness and cruelty.

Our author arrived in the kingdom of Bondou without any accident. He was frequently in danger of being detained by the sovereigns of the districts through which he passed. But after some hesitation, they always allowed him to proceed in his journey, and furnished him with a guide. The country of Foutatoro, which he had just quitted, contains, according to his account, two millions of inhabitants. It is watered by several rivers, on the banks of which the lands are rich and fertile, producing abundant crops of millet, cotton, rice, indigo, tobacco, &c. This country also possesses numerous mines of iron; and M. Mollien saw several of the furnaces in which the ore was smelted, which were of the same form as those described by Park. The iron is of excellent quality; and being malleable, is easily worked with the hammer. All the countries abound in elephants, lions, panthers, hyænas, jackalls, and other wild animals. The birds are ostriches, vultures, guinea-fowls, wood-pigeons, ravens with white necks, turtle-doves, partridges, and parroquets with black necks. The heat of the climate is intense, the thermometer at noon often rising to 96 degrees in the shade.

In the kingdom of Bondou, which is situated between the two rivers, the Gambia and the Faleme, and is about 300 miles inland, our author was everywhere kindly and hospitably received. His journey was not, however, without its dangers. This kingdom is properly speaking one vast forest, in which are interspersed here and there some clear spots, with small villages wretchedly built and nearly deserted. These forests are filled with wild beasts, which render travelling dangerous; and several places in the cool shade of this umbrageous retreat, which are

particularly agreeable to travellers, were pointed out to our author as unsafe, being haunted by lions, elephants, and serpents, which are attracted thither by their humidity. These serpents are of the largest species of the boa constrictor, which devour men and beasts. M. Mollien saw several muskets covered with their skins. The heat is intense, and the greater part of the trees are stript of their foliage by the scorching rays of the sun. Bondou possesses mines both of iron and gold. The districts watered by the Faleme, are extremely fertile. The inhabitants export slaves, gold, ivory, tobacco, cloth, and cotton to the neighbouring states in exchange for millet, fire-arms, powder, and cattle. A slave costs a double-barrelled gun, and two horns of powder. The slaves are well treated here as in other parts of Africa; and they have such facilities for escape, that they frequently assemble in troops of 200 or 300, and fly into the neighbouring kingdom of Bambouk, where they are well received.

From the territory of Bondou, in nearly the 13th degree of north latitude, and about 300 miles from the coast, the route northward to the sources of the Gambia, the Rio Grande and the Senegal, lay for more than 60 miles through an immense wood, which M. Mollien traversed in company with a caravan of fifty travellers, natives of the country of Fouta Diallon, between which and Bondou this woody desert intervenes. Most of these merchants carried their goods on their heads in oblong baskets, which were filled with cotton cloths purchased in Bondou; they had also with them oxen, goats, bows and arrows, and gold. Three of the merchants had asses laden with cloths, and leather bags filled with salt. They had scarcely entered the forest, when they were alarmed by the noise of a troop of elephants, about 200 paces distant, among the high grass which grows up under the trees. They hastened their march, for fear of encountering these formidable animals. The crossing of this forest occupies the caravan four days, during which they slept in the open air, always kindling fires, to preserve themselves from the attacks of wild beasts. On entering the territory of Fouta Jallon or Diallon, they had to climb some high and rocky mountains, over which the road winded through narrow and difficult paths. From this elevation they had an extensive view of the flat country beneath, inundated by the torrents which fall from the mountains, and covered with the richest verdure. Through these plains the Gambia rolls its stream. Arrived at the village of Niebel, situated amid craggy mountains, M. Mollien found a most unpleasant interruption to his journey from the tyranny or rapacity of Ali, the Iman or chief. To such interruptions all European travellers in Africa are un-

happily exposed, and the conduct of this chief to M. Mollien fully illustrates the precarious tenure by which their lives are held among this barbarous people. In this miserable village he was ordered to remain two days, till the pleasure of the chief should be known. In the mean time he was visited by his wife, who, without any ceremony, made free with the provisions which he had in his hut for his maintenance, and giving him to understand that he could only propitiate her favour by some suitable present, the following singular scene took place :

" I accordingly gave the Princess Maria three grains of coral ; she threw them on the ground with contempt, exclaiming, that ' she was not come to receive such trifling presents, and that she would never disgrace herself so far as to wear this coral.' It was really difficult to purchase the protection of so powerful a princess with so small a stock as mine. I therefore added to the three grains of coral three grains of amber. ' How trifling !' cried she ; ' give me coral.' I was in a critical situation. I perceived that this shrew would by degrees rob me of all my merchandize ; I however gave her two more grains of coral. ' This blanket,' then said she, ' pleases me ; make me a present of it.'—' But I am in want of it for the night,' replied I. ' Thou wilt not go to Timbo, then,' rejoined she, in an angry tone. I trembled at hearing this threat, gave my blanket to Boukari, and his to the princess ; she found it so dirty, that she threw it at my head with scorn, saying, ' This European is but a poor devil. I will return in the evening to know if he has reflected on his situation, and if he intends to continue to treat me in a manner so unworthy of my rank.' " Pp. 206, 207.

M. Mollien was afterwards sent for by the chief, and he gives the following account of the interview which took place :

" Ali was waiting for me behind the mosque. I went to him directly. His people formed a circle round him ; the faces of these satellites were sufficient to excite serious alarm. ' I have been to St. Louis,' said Ali to me ; ' I know that the white people are very rich. I expect a present worthy of thyself and me ; we are here upon the frontiers of Fouta Jallon ; I am all powerful there.'—' What wouldst thou have ?' answered I, without evincing the least discontent. One of his people, whose hideous features sufficiently displayed what part he played at court, cried, ' Let the white man first give thirty grains of coral.'—' But if I give them,' I answered, ' I shall have no other resource than to eat sand. Having said this, I offered him my present, which consisted of ten grains of coral. When I spread them on the ground before him, Ali's eye was inflamed, and his features, which denoted perfidy, assumed an expression of fury : ' Know,' said he to me, ' that if thou canst make me such a gift, I can offer thee one a hundred times more considerable. The people of Kakandé * offer me no presents but what are equal to my rank.'—' What dost thou demand, then ?' cried I, angrily. ' Money,' replied he,

* A village situated on the Rio-Nunez, where the Europeans carry on considerable traffic.

'I have none.'—'Powder.'—'I have no more than one charge.'—'Cloths.'—'I have none of them; besides,' added I, 'the presents I made to Almamy of Foutatoro, and Almamy of Bondou, were very small; they accepted them and thanked me.'—'And what is Almamy of Foutatoro to me?' cried Ali; 'for my part, I insist on having more. Thou doubtless art not ignorant that the white men pay tribute to Foutatoro and Bondou; I likewise demand one from thee on account of thy colour'—'But I am no merchant.'—'That is nothing to me; I am now thy king; give me twenty grains of amber, ten grains of coral, a parcel of glass beads for my attendants, and eleven grains of amber for the chief of the village.' Resistance to such peremptory orders would have cost me my life; for at Ali's command a hundred daggers would have been aimed at my heart. I therefore obeyed; and as I produced my grains of amber, the people who surrounded us burst out into shouts of laughter. 'Now,' says the Iman to me, 'thou mayest depart; I will even give thee a guide.'" Pp. 207—209.

Some blamed the chief for his tyrannical conduct to the white man, while others censured Ali for not robbing him of every thing, especially for not securing his horse. Availing himself of his permission to depart, he set out on the 31st of March, accompanied by his faithful guide Boukari, and by a merchant of the name of Boubou, whom he had met in his journey from Bondou, and on the 12th April he reached Timbo, the capital of the country, about 100 miles to the south-east His route was through a difficult and mountainous region, highly picturesque, and, in the vicinity of the rivers, rich and fertile. In the course of this journey, he visited the sources of the Gambia and the Rio Grande, which take their rise in the depth of a thick forest about 1300 paces from each other. Timbo is a large place, containing 9000 inhabitants, a spacious mosque, and three forts, in one of which is the palace, consisting of five large huts regularly built. The rainy season had now commenced, and our author, in consequence of incessant fatigues, felt his health beginning to decline. He gave over all intention therefore of penetrating to the Niger, and as he was afraid of being detained, he took advantage of the permission he had obtained to depart, and set out on the 22d April, to retrace his steps. On the 2d May he reached Bandeia, the residence of Boubou, the new friend he had formed while travelling with the caravan, his journey being still greatly retarded by the inundated state of the country, owing to the periodical rains which had now become frequent. In the course of this journey he explored the source of the Senegal, which is not far from the town of Timbo, having bribed one of the natives to be his guide in these expeditions, the object of which he was obliged to keep secret, in consequence of the su-

perstitious aversion of the people to expose the sources of the rivers to any European.

On the 4th May, a tremendous peal of thunder announced the complete setting in of the rainy season, which had been but partially felt before. Our author describes in animated terms the scene which followed.

"At this terrible sound, all the inhabitants rushed out of their huts; we saw the storm in the east like a thick fog, enveloping the highest mountains from our sight. It approached; the mass of water which advanced was prodigious, but its progress was so slow that we had time to quit our own hut, and seek refuge in Boubou's, which was more substantial. We had scarcely entered, when the frightful spectacle of a deluge presented itself; the rain descended in torrents; hail augmented the horror of the scene; the cattle not knowing where to find shelter, uttered dismal moans; in an instant the ground was inundated. It is impossible in temperate climates to form any idea of the quantity of rain which falls for six months of the year in the tropical regions of Africa. The humidity which is thus diffused throughout the atmosphere, is the most formidable obstacle to the progress of Europeans in this part of the world, in consequence of the diseases which it engenders among them." P. 270.

M. Mollien soon began to feel the fatal influence of this unhealthy season. He was attacked with fever and dysentery, and being reduced to the lowest state of weakness, he believed that his end was approaching. To add to his miseries, he discovered that Boubou, under the mask of friendship, was his greatest enemy, and was indeed plotting his death that he might seize his property. Finding his disease too slow for his wishes, he endeavoured to quicken its operation by means of poison, which he mixed with his food, observing at the same time to one of his friends, "I must not be out of the way, for I know that in "a few hours the white man must expire." The poison not being very skilfully prepared, was not taken in sufficient quantity, and Boubou, finding this expedient fail, had recourse to open violence. He threatened the inhabitants of the village if they furnished the dying victim of his hatred either with food or water. Our traveller must soon have ended his days under this prohibition, had he not been relieved by the humanity of one woman, who waited upon him in defiance of Boubou's threats. The wretch seeing his schemes frustrated, entered the hut where Mollien was stretched out, and threatened to cut his throat; and our author expresses his surprise that he did not make his words good. The following is the melancholy account which he gives of his situation:

"Alone with my guide in the midst of the woods, debilitated by sickness, far distant from any frequented roads, in the hands of assassins, flight appeared impossible; besides, the inhabitants of the

village; certain that I should soon expire, sent their children round my hut, who threw stones at me, overthrew the water, or took away my provisions; they carried their vexations one day to such a pitch, that I fired my gun amongst these wretches; the shot did not take effect, for my arms wanted strength to preserve the level." P. 277.

To the same purpose he afterwards observes:

"A gloomy despair soon seized me; lying on some bundles of straw, near a fire*, the smoke of which almost prevented me from breathing or opening my eyes; procuring, not without difficulty, a few handfuls of rice badly cooked; tormented in a thousand ways by the women and children, who took advantage of the absence of my Marabout to waken me, or throw stones at me; I prayed to heaven to deliver me from a miserable life, which was only a burthen to me." P. 280.

Being determined at all hazards to quit Bandeia, he prevailed on Ali, his guide to the sources of the rivers, to be the companion of his flight. They were soon overtaken, however, by Boubou, and Abdoul, who, in the absence of his brother, acted as chief, and over whom Boubou, by his artifices, had obtained the entire ascendancy. At length M. Mollien gained over to his interest, by a considerable sacrifice of his property, namely, the half of his gunpowder, 16 grains of coral, and 15 of amber, Saadou, the brother of Abdoul, and by his interest, joined to that of his brother Mamadou, he was at length allowed to depart. His plan was to penetrate westward, directly across the country, to the Portuguese settlements on the coast.

The country of Fouta Diallon is covered with mountains throughout its whole extent, which form the termination of a much more lofty chain, situated to the south-east, the most elevated of which the Negroes say is covered with a white hat, by which they probably mean snow. This high ground is productive in iron ore. The plains are covered with soil of the richest mould, washed down by the heavy rains from the mountains, which continue after they set in for six months. During this season the champaign country resembles an immense lake. Lions, panthers, and hyenas, are found here, but not in great numbers. Elephants are scarce; the ape is seen every where, with a thick mane and a hideous belly. Antelopes and deer are frequently met with. Hides, ivory, wax, and slaves may be procured from this country, in exchange for silver coin, fire-arms, gun-powder, and cloths.

M. Mollien left Bandeia on the 15th June, and on the 15th July he arrived at Kansoraly, within a short distance of the

* The Negroes keep a fire constantly in their huts, to preserve them, as they say, from thunderbolts.

Portuguese settlement of Geba, worn down with sickness and fatigue, having travelled above 200 miles through a country flooded with rain, and in many parts nearly impassable. He dispatched his faithful attendant Boukari, with a letter to the Portuguese commandant, requesting him for some tea, sugar, and tobacco, and had the happiness of receiving a supply of these articles, as also of bread, sugar, port-wine, and snuff, and a kind invitation from the Portuguese commandant to repair to the settlement. Here he was most hospitably entertained, and solaced with all the luxuries of civilized life. This establishment is situated 60 leagues north-east of Bissao, a Portuguese fort on the coast. The climate is hot, damp, and unhealthy. M. Mollien saw here but three Europeans, and they were so emaciated that they looked like spectres risen from the tomb. In the course of six days he set out in a vessel down the river Geba, for the Portuguese settlement of Bissao, where he arrived after a voyage of three days, during which he was drenched with incessant rains, and exhausted by fatigue and want of proper nourishment. On landing, his unshaven beard and ragged clothes drew around him a crowd of Negroes, who incessantly insulted him and laughed at his appearance. He was received, however, with unbounded generosity by the Portuguese governor, who loaded him with all the comforts necessary to revive him from his languishing condition. Here M. Mollien remained till the 1st November, being so reduced in strength from the incessant rains which fell during the months of August, September, and October, added to the suffocating heat which prevailed, that he seldom quitted his bed. With the dry season his health was somewhat restored, when he returned to Geba, with a view of travelling southward by land to the French settlement of St. Louis. He finally embarked, however, in a schooner, from Bissao for Goree, whence he travelled to St. Louis by land, where he was joyfully received by his friends, who had long given him up for lost. He procured a grant of land for his faithful attendant Boukari, as an acknowledgment of his important services; and the governor made him a present besides of various kinds of merchandize. M. Mollien returned to France in 1819; but his health was so shattered by the African climate, that his native air did not re-establish his strength so quickly as he expected.

In the course of this adventurous journey through barbarous and unfriendly tribes, M. Mollien appears fully to have sustained the character of an enterprising traveller, and his work contains all the information which could reasonably be expected from such an expedition. Respecting the commerce, religion, go-

vernment, and domestic manners of these African nations among whom he sojourned, his details are full and satisfactory; they are precise without being tiresome, and while such minute local accounts of these remote and unfrequented regions are in themselves highly interesting, they serve at the same time to confirm and illustrate the narratives of other travellers. Great part of M. Mollien's route lay through countries never before visited by any European; and this, aside from every other consideration, stamps a value on his work. If, to gratify an eager curiosity for a knowledge of the interior of Africa, the narratives of shipwrecked mariners, loosely thrown together, from an imperfect recollection, are thought worthy of publication, the journal of a man of science, not travelling over sandy deserts, but through populous and commercial countries, must be doubly interesting. M. Mollien has, besides, accurately fixed the sources of the Senegal, the Gambia, the Rio Grande, and the Falemé, the position of which has hitherto been but imperfectly known, and in this view therefore his journey must be considered as of importance, as helping forward the great work of African discovery, and as throwing light on the character and manners of the various tribes which occupy the interior of this great continent.

ART. III. *Reformation in the Catholic Church of Germany, and the Downfall of Papal Authority, detailed in a Correspondence with the Court of Rome, on the subject of the nomination of the Vicar-General Baron Von Wessenberg, as successor in the Diocese of Constance, and Diocesan Administrator. Accompanied by the various Documents referred to in the Correspondence; a Prefatory Memorial, giving a brief Account of the extraordinary Proceedings of the Court of Rome on the occasion, and the Measures adopted in consequence, by His Royal Highness the Grand Duke of Baden; and an Introduction, written expressly for the translation, by the Attorney General of the Kingdom of Bavaria. Translated from the original German.* 8vo. London. Ackerman, 1819.

THE foundation upon which the wonderful system of spiritual dominion to which the appellation of Popery is properly given, evidently rests, is the absolute power of the Roman Pontiff over the administration of the church, and the election and functions of its ministers. In the estimation of the most devoted adherents to the successors of St. Peter, this dominion can be controlled by no earthly authority; whilst more moderate Catholics

believe that it may be regulated and affected by the decrees of a General Council. The astonishing combination of causes which led to the completion of this arrogant but insidious despotism, which so long paralysed and deformed the intellectual and religious state of Europe, is familiar to every reader of ecclesiastical or even of general history: without therefore attempting to enumerate them, it will be sufficient for the object which we now contemplate, to remark, that these causes would, in all human probability, have proved ineffectual, had not the Pontiffs succeeded in disseminating the belief that the Scriptures ought not to be perused by the great body of the people, or should uniformly be interpreted according to their own dictates, which, proceeding, as they contended, immediately from the inspiration of the Holy Spirit, were marked by the infallibility of Him who cannot err. The moment that this became the faith of mankind, religion was just what the Popes wished it to be, the use of reason was suspended or regarded as impious, and there was no absurdity so gross, and no usurpation so scandalous and oppressive, as to rouse that indignation and that abhorrence, which, had the word of God been the accessible standard of belief, tyranny would have been unable to suppress.

There were, it is true, at all times, some who stood aloof from the prevailing superstition, and who, firmly cleaving to their right of searching the oracles of divine truth, reprobated Popery as a corruption of Christianity; but in ages of ignorance they were unable to make all the use of their knowledge which they would otherwise have done, and they were pursued with such unrelenting bigotry, and often visited with such cruel and execrable persecution, that they gladly cast a veil over their tenets, thinking themselves happy if, without molestation or punishment, they could secretly cherish them. Still, however, they sowed or preserved the seed from which the most valuable fruit was afterwards to be reaped, and their disciples swelled the numbers of those who were at length impelled and enabled to vindicate their most sacred privileges, and to secure their most precious blessings.

But although the fact unquestionably was, that the moment at which the supremacy of the Pope was disputed, the foundation of popery was directly assailed, and its most revolting feature was pointed out, it required considerable time, and considerable experience, before this was distinctly perceived. The whole mass of doctrines, whether religious or political, which formed the creed of Rome, was considered as firmly united; or was believed, that what in it was found to be erroneous might be separated or renounced, whilst the fabric itself continued in original strength. Accordingly Wickliffe, although he real-

ly anticipated the most valuable and luminous principles of Luther, was convinced that he was not shaken in his fidelity to the see of Rome, and he died in communion with it; whilst Luther himself, after he had in fact dissolved the charm which for ages had been cast over the triple crown of the Pontiffs, repeatedly and most sincerely declared that he was the submissive servant of the Pope, and that he shrunk from whatever tended to weaken acquiescence in his high pretensions and his mysterious sanctity. Living, however, at a time infinitely more favourable to the enlargement of the human mind, than that upon which Wickliffe was thrown, and when mankind, shocked with the shameful atrocities of the Pontiffs, and with the abominable licentiousness of the priesthood, were prepared and disposed for reformation, he was led to carry out the discoveries which he had made. Having from his examination of Scripture been conducted to the fundamental and noble truth, that it is the only rule of faith, he tried by that rule the claims of the Pope, and he soon found that they rested upon the most humiliating delusion, and the most barefaced imposture. The doctrines which he promulgated were eagerly embraced; many of the German princes discerned that they might through them be emancipated from the degrading bondage under which they had long groaned; whilst vast numbers, delighted with the purity and sublimity of divine truth, which had now burst forth upon them, warmly supported the reformers, withdrew from the communion in which they had been educated, and formed churches avowing the authority of Scripture, and regulating by it their faith and their practice.

It might be supposed that this revolution would have opened the eyes of the whole Christian world, and that when the divine record was actually laid before them, men would gladly have had recourse to it, and would, without regard to human authority, have derived from it alone the counsel of heaven, indignantly resisting every attempt to keep from them so valuable a privilege. But the triumph of truth is often slowly obtained. Prejudices deeply rooted, and not unfrequently endeared by those tender recollections, and those early associations which excite the finest feelings of the heart, retained their ascendency in a great many, and preserved undiminished veneration for the established religion; the questionable positions which the reformers mingled with the essential doctrines of the Gospel having been opposed and confuted, the inference was drawn, that having erred in some points they had probably erred in all; and the faults and outrages of which some who professed to be attached to them were guilty were imputed to the whole, and made them not unfrequently be regarded with moral abhor-

rence. Political causes also soon conspired in favour of the hierarchy—some sovereigns, apprehending that their privileges might be abridged, or that their enemies might be strengthened by the ascendency of the new party, zealously opposed it, and easily found means to cast over their interested policy the sanctity of religion. Hence it happened that the ancient faith in many of the most extensive and populous countries in Europe preserved its ascendency, and having surmounted the first shock, even gained strength by the opposition which had ineffectually been directed against it. Many of the abuses which had clung to it were removed; the clergy, roused from their indolence, cultivated their faculties, and devoted themselves to theological inquiries; thus the system was presented under a fairer aspect, and was surrounded by men much more competent than formerly to illustrate and to defend it. The animosities which naturally arose between these and the advocates of the Reformation, were not favourable to dispassionate inquiry, and the mind was shut to conviction, it being regarded as a point of honour no less than of religion, not to recede from what had been previously believed.

It is evident, however, that although these causes sufficiently account for the too effectual check that was given to the progress of the Reformation, and for the aversion that was shewn to admit what it was difficult to conceive could have been rejected, still they were of an accidental nature, which change of circumstances, or the progress of the human mind might weaken or remove; whilst, on the other hand, the erection of the Protestant churches, and their zeal in diffusing the Scriptures, preserved the means of dissipating error, and of exposing in its true colours the usurpation of the Roman Pontiffs. There was thus unceasingly operating an influence which could scarcely fail powerfully to affect the state of religion, and in part to lay the foundation, not indeed for uniformity of belief amongst Christians, but for the general and cordial reception of maxims in reference to ecclesiastical jurisdiction wholly incompatible with the continuance of the Papal supremacy, and for the free exercise of private judgment in matters of religion, which the increase of science and of knowledge was daily shewing to be requisite in conducting every other investigation to which the intellectual faculties can be directed.

These observations are strikingly illustrated and confirmed by the small work to which we would now turn the attention of our readers. It is entitled, perhaps, rather with too sanguine anticipation of the completeness of the change which it indicates, "Reformation in the Catholic Church of Germany, and the downfall of papal authority," and contains a correspondence which

took place with the Court of Rome, upon occasion of the appointment of Baron Von Wessenberg, an amiable and respectable divine, to the high ecclesiastical office of Bishop of Constance, a city in the south of Germany, contiguous to Switzerland; which appointment had taken place in direct opposition to the wishes and even the mandate of the Pope. We shall endeavour to give a short and clear view of the correspondence, which, as a literary production, is of little moment, and does not call for the exercise of our critical judgment; but which is well entitled to anxious perusal from its connexion with the highest and best interests of a large portion of the Christian world.

In an advertisement which the translator has prefixed to the work, much information is communicated respecting the contest to which the correspondence refers, and the character of the prelate on whose account it took place.

"The following sheets contain the particulars and the documents relative to the contest now pending between the Catholic Bishop of Constance, Baron Von Wessenberg, and the See of Rome. This event, at the present moment occupies the attention of all Germany; and the consequences to be expected from it will, in all probability, mark the occurrence as a momentous epoch in the history of Europe."

Of Von Wessenberg himself, we are presented with the following interesting account.

"With respect to the immediate subject of the following pages, it may be proper to inform our readers, that he bears the character of a pious, a moral, and a benevolent man, and his zeal in the good cause is indefatigable. His piety is without superstition, his moral principles are of the purest kind, his charity is without ostentation, and his activity unparalleled. Like the primitive teachers of Christianity, he frequently assembles the clergy of his diocese, instructs them in the holy Scriptures and in matters of religion, and enjoins them to communicate his lessons to their flocks."

Of the accuracy of this account there can be little doubt; because, powerfully as this Prelate has excited the indignation of the Church, and prominently as he has been brought forward to the view of the public, any attempt at misrepresentation, for the sake of promoting the cause to which he is attached, would be infallibly exposed, and would defeat the object for which it was intended. We have, however, a direct confirmation of it given in what is styled the introduction to the work before us, an able paper written by a Catholic gentleman, holding the office of attorney-general in the service of the King of Bavaria. Speaking of the facts detailed in the correspondence, he observes: "They "exhibit in the person of Baron Wessenberg an upright and "honourable Prelate of the German church, universally belov-"ed and respected, for his moral character, his knowledge, "and his merits." He has excited, we are assured by the translator, the deepest interest. "Among both the Catholics and

" Protestants in Germany, but one opinion prevails as to the " conduct and praise-worthy intentions of Baron Wessenberg; " they are unanimous in their wishes for his success." Even the attention of the Catholic princes has been powerfully directed to the struggle in which he is engaged, feeling, it is asserted, the most ardent desire to free themselves and their people from the shackles of hierarchical usurpation.

Charles Theodore Von Dulberg, Prince Primate, the former bishop of Constance, wishing, after he had attained to an advanced age, to associate with himself a successor in whom he confided, had recommended Wessenberg, of whose character and talents he entertained the highest opinion. The Court of Rome, however, upon application being made for its confirmation of this arrangement, preserved the most profound silence; and thus virtually refused the request which had been presented. Upon the death of the Prince Primate, Wessenberg was elected Capitular Vicar of the diocese, and this was immediately announced to the Pope. To this intimation the following answer was returned, which, for many reasons, must be read with much interest.

" Beloved Sons, our salutation and Apostolical blessing.—Your letter of the 18th ultimo, in which you announced to us the death of Charles Theodore, Archbishop of Ratisbon, and administrator of the Church of Constance; and in which you informed us, at the same-time, that the office of Capitular-Vicar had been conferred by you on Baron Ignatius Henry Von Wessenberg, has filled us with no small degree of pain. It cannot be unknown to you, and is in reality not unknown, that the said Von Wessenberg had excited our displeasure to such a degree in matters of the utmost importance, that we wished his removal from the place of Vicar-General, which he filled. How then has it happened that, laying aside all reverence for us, and this holy chair, you could elect the very man of whom we disapproved as Vicar-General, to fill the still more important office of Capitular-Vicar? But still, not satisfied with this, you have even dared to desire from us the confirmation of your election. Let the following serve you for answer to your request, which, to speak of it in the mildest terms, was most unadvised. We not only do not approve the election of Von Wessenberg, as Capitular-Vicar, but we will not even in any manner recognise him as such, or Antony Reineger as his representative; nor will our spiritual tribunals acknowledge them, or pay the smallest attention to any writings which may be issued by them. We therefore, in virtue of the apostolical power entrusted to us by God for the good of the whole church, command you, that, setting aside the election of Von Wessenberg, you make choice of a Capitular-Vicar in good repute with Catholics, and capable of discharging, in a correct and proper manner, the duties of the office to which he is appointed. This letter will grieve you, but may it grieve you unto repentance, that you may yield obedience to us, and afford a solace to

our affliction, and a speedy remedy to the evils which you have occasioned. In the certain hope of this, we bestow on you affectionately our apostolical blessing. At St. Peter's, under the Fisher's ring. Given at Rome the 15th March, in the year of Salvation 1817, and in the 18th year of our pontificate."

There is here an absolute command to set aside the election of Wessenberg, merely because he was not acceptable to the Pope, and that command is issued in virtue of the apostolical power entrusted to him by God, language plainly indicating that little change has taken place in the real spirit of popery. This, indeed, is explicitly asserted by the writer of the introduction to this work.

"The fundamental system of the Papal See, unlike that of other courts, is not the result of individual opinion, adapted to particular exigencies, but dates its origin from the earliest ages of the Roman Church. In spite of its long duration, and without the aid of documentary support, tradition alone, as in the case of national superstitions, has faithfully preserved and handed it down, unbroken and undiminished to the present time; its sway at this day, though more concealed, is the same as it was centuries ago, notwithstanding even the mild character of the present supreme Pontiff. Its aim is the unlimited extension of the papal power over secular princes as well as ecclesiastical dignitaries."

A letter was also addressed by the Court of Rome to the Duke of Baden, the sovereign in whose dominions Constance is situate, in which the Pope remonstrated against the election of the Bishop, alluded to a former mandate for depriving him of the office of Vicar-General, which had been disregarded; accused him as a man of perverse doctrine, and very bad example, a charge explained by the addition made to it, that he had been guilty of wicked and malicious opposition to the commands of the Apostolic Chair; intimated the rejection of him as Bishop, and called upon the Duke to exercise his authority in support of this rejection, because no respect could be entertained by believers for a man whom all the good abhor, and of whom they know, by means of certain and undoubted proofs, that he did not possess the approbation of the Pope. Von Wessenberg was thus not only required to divest himself of his bishopric, but his sovereign was called upon, as a dutiful son of the Church, to use his authority to compel him to do so. In other times, whatever might have been the case with the Prince, there would have been no hesitation on the part of the Prelate; he must at once have obeyed, casting himself prostrate before the successor of St. Peter. But Wessenberg, although professing the utmost reverence for the Pontiff, determined to retain his situation, and, with a just sense of what he owed to himself, and a manliness shewing his fitness for the arduous part which he had to act, to

repair to Rome that he might repel the charges, or rather the insinuations against his doctrine and conduct, and endeavour to extort from infallibility itself an acknowledgment of error. However we may admire this intrepidity, it was quite inconsistent with popery, and implied in it a resolution, should it be requisite, of renouncing even nominal adherence to it.

The Duke of Baden replied to the letter of the Pontiff with becoming respect, but defended the election of Wessenberg; bore the most ample testimony to his high merit, and to his qualifications for the dignity to which he had been exalted; declared his conviction, that, after due investigation, his Holiness would afford to this man suitable reparation, confirmed, as he had no doubt that the Pope would be, in the innocence of the Prelate; and concluded by expressing his trust, that, under these circumstances, no attempt would be hazarded to effect an alteration in the present condition of things, or to undertake any thing prejudicial to his just rights. When the Bishop finally resolved to go to Rome, he was furnished by the Duke's minister for foreign affairs with an official letter to the Pope's secretary of state, in which the minister declared how extremely agreeable it was to his master that Wessenberg had expressed a wish to throw himself at the feet of his Holiness, and afford all such explanations as the Holy Father might demand, adding that the Bishop enjoyed in his own country the highest degree of respect, esteem, and confidence.

Upon his arrival at Rome, Wessenberg communicated to the secretary the purpose for which he had come to it, and in reply to this intimation he was furnished with an enumeration of all the grounds upon which the Pontiff regarded him with abhorrence, and considered it as part of his sacred duty to remove him from the situation which had been so honourably conferred on him. Before proceeding to these, however, it was observed to him, that his Holiness would not fail above all things to be infinitely astonished and grieved, that he still continued to take the title of Capitular-Vicar, and to interfere with the administration of the bishopric of Constance, even after the brief of his Holiness had been issued against him, declaring the determination of the Pope not to acknowledge him, and enjoining the Chapter to proceed to the election of another person. This certainly, according to the maxims of Rome, was rebellion against the head of the church, because it implied a virtual abjuration of that infallibility upon which the whole system of Popery must rest.

But there were other charges brought against Wessenberg, to which it is proper to allude, as throwing light upon the principles which he entertained, and upon his general conduct with respect

to religion. The secretary informed him, that the Holy Father was indignant at a decree, which, as Vicar-General of Constance, he had published, relating to marriage, and which was branded as being directly at variance with the common law recognised by the council of Trent. He was farther accused of having defended the infamous P. Thaddæus Dereser, as he is styled by the Papal secretary, and for having done so, although this man had been formally condemned by his Holiness Pius the Sixth. Dereser had promulgated certain tenets most offensive to the court of Rome, and which it lost no time to reprobate. The archbishop of Cologne had formed a very different opinion of them, and had given Dereser the most satisfactory testimonies: in consequence of which Wessenberg had, as it was asserted, declared that these testimonies annihilated every doubt as to the orthodoxy of the man to whom they were granted, all accusations of him having been found groundless by the legitimate archbishop, to whom the right of inquiry into this matter belonged. This remark the secretary stigmatizes, as involving in it the positions, that the sentence of the Holy Father, in points of doctrine, may be corrected by a mere bishop,—a proposition which no Catholic, he maintains, at all acquainted with his religion, ever conceived that *salva fide* he could affirm,—and that as it thus does not belong to the Holy Pontiff to decide as to doctrine, he assumes when he does so a right that was not granted to him by Jesus Christ. The bishop was farther accused of having composed or approved certain books containing the most exceptionable tenets, and particularly of having given his sanction to a particular work as being pure Catholicism, in which amongst others the following points were inculcated:

"That the proofs adduced by theologians in support of the infallibility of the church, although strong, are not however of such a nature but that they might be easily refuted.—That the Catholic church does not require a supreme pastor, and a visible head.—That infallibility was bestowed by Jesus Christ upon the whole body of believers who form the true church.—That the supreme authority of the Roman Pontiff is dangerous, and similar to the Trojan horse, as having been the cause of incalculable evils, particularly in ancient times, when the Roman Pontiffs exercised a despotic power over the kings and princes of the earth.—That a supremacy of jurisdiction in no respect belongs to the Roman Pontiff, but solely a supremacy of pure honour.—That the Catholic doctrine, that there is no salvation out of the true church of Christ, which is the Catholic church, is contrary to Christian love, and false and erroneous.—That the doctrine of transubstantiation is absurd, the rite of the mass theatrical and ostentatious, the invocation of saints superstitious, the Catholic doctrine of purgatory fantastical, and the worship of images idolatrous."

There can be no doubt, if the cardinal secretary was right in his assertion that Wessenberg considered these tenets as pure Catholicism, that the bishop had to all intents abjured the Roman church, and embraced the Protestant faith.

The secretary also communicated to him, that in many ways he had given offence to believers, as for example, "He had "abolished by a decree, a number of holidays and vigils; he "had granted dispensations with respect to abstinence from "flesh meat on all Saturdays of the year, the four quarterly "fasts not excepted; he had sanctioned an ordinance by which "all writs from Rome had been deprived of effect in the district "which he superintended, till they had received the approbation "of the ecclesiastical body of the province; he had prevented "pastors within his bishopric, who were desirous of receiving "briefs from the Apostolical Chair respecting absolution and "the like, from obtaining them; he had introduced the mother "tongue and other scandalous abuses into the holy liturgy, un-"der pretence of zeal for the ancient discipline of the church; "and he had given consent to many secularizations of religious "persons, granting dispensations to some of them from their so-"lemn vow of chastity." All this was in direct opposition to the system of Popery, but still they do not amount to any charge against the moral character of the Bishop of Constance, or afford any ground for the representation which, in an official document the Court of Rome had given of him, that he disgraced by his enormities his sacred character. It may fairly be inferred from this, that nothing could be adduced against Wessenberg detracting from the purity of his life; but perhaps the Secretary imagined that the heavy accusation, to which we have alluded, was supported by the following passages: "Many other and certainly "very grave denunciations have, on many occasions, been trans-"mitted to the Holy Chair against you, as, for example, that "you are a member of the society of Free Masons; that you are "considered one of the first, if not the most distinguished of the "conspirators against the centre of Catholic unity, a charge esta-"blished by the letter of a Protestant, who, in connection with "others, attempting the great object of a separation of Germany "from Rome, makes mention of your name; and that you are ac-"cused by most respectable persons of having, with five other "worthless clergymen, formed and avowed the abominable inten-"tion of banishing, in the short space of two years, every idea of "the divinity of Jesus Christ from Germany." This is indeed a heavy accusation, but it loses much of its force from what immediately follows, "not to mention your design of wishing to "annihilate the exercise of all Papal authority in the regions in

"question, and to substitute in its place that of a Patriarch, "who shall be chosen independently of Rome." The fact seems to be, that the Court of Rome suspected that Wessenberg was anxious to raise himself upon the ruins of the Popish hierarchy; for we find in the letter addressed to him, this singular passage. "It cannot be unknown to you, that the very offensive Journal, "which bears the title of *Opposition*, and is printed at Weimar, "after delineating the qualities which the newly imagined Pa- "triach for Germany ought to possess, and declaring that from "henceforward the Holy Scriptures, and not the Roman Pon- "tiff, shall determine religious disputes, and that the Scriptures "shall no longer be expounded by the Pope, but by reason only, "designates by marks which it is impossible to mistake, your "person as the most capable of filling such a place, and pro- "moting the above mentioned purposes."

From the view which has been given of the opposition made by the Court of Rome to Wessenberg, there can be little hesitation in concluding, that he had long acted in a manner very different from what he would have done had he been a strict and zealous adherent of Popery; and that whatever were his ultimate designs, he entertained opinions much more in unison with the tenets of the Reformation, than with those of the Church to which he professed to belong. This is abundantly confirmed by the answer which he returned to the letter of the secretary. He attempts to shew, and he often succeeds in shewing, that much misrepresentation of his conduct had been conveyed to the Holy Father; he asserts, that by the arts of unworthy men, the Pope had been misled; he declares his vast anxiety, in all respects, to approve himself to him; but he still holds the ground which he had taken; he never makes the most distant approach to absolute submission, surrendering his own judgment to that of the Pontiff, and, in the face of the most explicit injunction, persists in retaining the office, which, had he been a devoted Catholic, he would instantly have resigned. After various communications with the Court of Rome, he concludes the correspondence in the following terms, which, however guarded and respectful, must be considered as a defiance to the Pope, and a plain intimation that he regarded himself as warranted to resist his authority. "Having now expressed my personal sentiments, which "afford a strong proof of my desire to satisfy the Holy Father, "I must, of necessity, stop at the line of my duty towards my "sovereign, the chapter and clergy of the diocese of Constance, "and Germany in general." Thus then stands the case between the Pope and the Bishop of Constance. The Pope has required him to resign his benefice, and has pronounced the most severe

censure against him for his opinions and for his public conduct; but the bishop retains his situation, and has repelled the charges which the Pontiff has sanctioned. He may therefore be viewed as no longer a member of the Romish Church, since he has defied its fundamental maxims: and the vast numbers who have joined with him, and who eagerly support his cause, are ready to take the direction which he may see proper to give to them. There can be no doubt then, that this is the ostensible commencement of a new reformation, and that it may, and probably will, be attended with the most beneficial results.

The state of the world is unquestionably, if we look merely to secondary causes, infinitely more favourable for the wide dissemination of the liberal views and sentiments of Wessenberg and his followers, or for the extension of Protestantism, than it was at the glorious era of the Reformation. At that period, the intellectual darkness which had long hung over Europe, was only beginning to be dispelled; mankind were little accustomed to that free discussion which calls into exercise, and strengthens the intellectual powers—superstition was upheld by numberless supports, of the solidity of whose foundation ages had ceased to doubt—and the sacred Scriptures were locked up, being not merely unknown to the people, but consulted only by a few of the learned. The Reformation, under these circumstances, must have appeared an awful, but a doubtful experiment—and against it, accordingly, were turned the efforts of all who, averse to innovation, wished rather to retain the system under which Europe for centuries had been placed, than to throw every thing loose, and, as it might be, to introduce confusion and licentiousness. But since that time, the great work of intellectual improvement has been rapidly advancing—the unreasonableness and the disgrace of blind submission to authority where reason is competent to decide, have been discerned—the errors and abuses which had been introduced into religion, have been exposed—and the Scriptures have been rendered so accessible, that the utmost jealousy of the Popish priesthood cannot keep them out of the hands of their votaries—and some of them have even thought it better freely to communicate the word of God, than to allow it to be perused, as perused it would be, as a prohibited work. The principles of the Reformation have now, by long experience, been proved to be quite compatible with the stability and energy of government, and they have exhibited ecclesiastical jurisdiction in the light in which even Catholics think that it should be regarded. It is not perhaps therefore too much to hope, that a momentous revolution in the state of religion in Germany is commenced, and that, under the guidance of Providence, it

will be crowned with the happiest success. Even some enlightened Catholics anticipate this change. The author of the introduction, to which we have frequently referred, makes the following remarks, which there is reason to think, are in harmony with sentiments extensively diffused.

"The Court of Rome seems to be incapable of moderation; its spirit remains unaltered through a series of ages, in spite of the change manifested in the spirit of the times; and, for this reason, will it hasten more speedily towards its downfal. It has, on the one hand, no longer the darkness of earlier centuries for its ally; whilst, on the other, opponents of a different mettle are to be faced. Formerly, the Popes, supported by the people, entered the lists against sovereigns only, now the people themselves, joined with their princes and bishops, form fearful odds; and these three, assailed by the Papal See, will, through the obstinacy of their opponents, in the end feel induced and compelled to settle their ecclesiastical concerns amongst themselves, without Roman interference. Thus separate and independent national churches will form themselves."

In the advertisement to the work, the translator having dwelt upon the increased freedom of opinion, and upon the spirit of sound discussion so widely diffused throughout Germany amongst all classes of men, remarks—

"Our Catholic brethren in Germany have themselves begun the work of shaking the remaining foundation of the mouldering Colossus. Every enlightened Catholic in Germany looks to the cessation of the Papal power, as to an event near at hand. Whoever has recently travelled in the south of Germany, will acknowledge the truth of this observation."

The labours of Protestants will not be wanting to strengthen the influence of the liberal principles thus extending their empire; still, however, it is to be recollected that we cannot confidently reason as to the certainty or the extent of any religious revolution. There are multitudes not brought into public view who are warmly attached to the faith of their ancestors, and to whom the powerful consideration to which allusion has been made will appear in a very different light; whilst causes which we cannot discern may arise out of the passions or the interests of men, sufficient to arrest what there was the strongest ground for trusting, could not be resisted. The remembrance of this ought to stimulate exertion, and prevent despondency, should the bright prospect now opened be for a season overcast. Much cause is there to rejoice over what has been already accomplished, for no fact is more certainly established, than the tendency of the Protestant faith to promote the best interests of mankind, to call forth the intellectual powers, to create or to give energy to the active habits which spread around those who cherish them comfort and abundance, and to inspire those

feelings of independence and that just sense of liberty, which raise man to the place which by his Creator he is destined to hold. In no part of the world is the truth of these observations more apparent than in Germany, in the striking contrast between the Catholic and Protestant states which it comprehends. Even with a view then to the temporal improvement of man, the events to which the volume before us refers must be viewed by the philosopher and the philanthropist with no ordinary interest; and when we take into estimation the unspeakable religious blessings which may result from them, they must be contemplated as amongst the most momentous occurrences to which the attention and the hopes of mankind can be directed.

ART. IV. *Further Observations on the practicability and expediency of Liquidating the Public Debt of the United Kingdom.* By RICHARD HEATHFIELD, Gent. Author of "Elements of a Plan for the Liquidation of the Public Debt of the United Kingdom." Pp. 123. 8vo. Longman & Co. 1820.

IN a late number we gave our opinion with freedom and sincerity of Mr. Heathfield's plan, and stated the difficulties which appeared to us to oppose its execution, for the removal of which we had not discovered any adequate resource in the speculations of this author. Our object was to excite, not repress discussion, upon a subject so vast and complicated, that, to grasp it in all its bearings, must surpass the hope even of the most confident theorist in political economy,—and, at the same time, of such deep and commanding interest, that we cannot imagine any one to view the discussion or its results with indifference. Mr. Heathfield has justly appreciated our motives, and has felt that it is becoming the author of so great a project to be invigorated only, but not exasperated, and far less discouraged, by the opposition which he may expect to encounter. He has accordingly come forward with these additional illustrations of the principles for which he contends, and, while he grapples with the objections that have been urged to his proposal, enlarges on the train of benefits which its adoption is calculated to produce, and expands many of the views of which he was able only to give some very slight intimation in his original summary of the elements of his plan. We think it due not less to the candour and good-sense with which the author conducts the controversy, than to

the general and deep interest which we understand his speculations are creating in the metropolis and throughout the country, to give our readers the earliest intelligence of the progress of the discussion—a course to which we are more especially invited by the notice which the author has been pleased to take of the remarks already made by us on his plan, and the obligation imposed upon us in consequence, of maintaining our place in this amicable disputation.

It is far from our intention to recapitulate at length our objections to Mr. Heathfield's proposal, or to retrace the ground over which we have already attempted to conduct our readers. We shall confine ourselves to what appears to us new and additional in his present publication, reserving for the close of this article a few remarks on his reply to the objections formerly stated by us to his project.

Mr. Heathfield's chief object at present, seems to be, to propitiate the landed interest, upon whom his *primary* assessment for the liquidation of the larger portion of the public debt must descend so heavily. The assessment is 15 per cent. on the whole value of property,—extending, as he computes it, from the materials afforded by Dr. Colquhoun's work, to one hundred and eighty millions,—upon which assessment, the interest, at 5 per cent., which the landholder is to have the option of paying for a series of years, amounts to nine millions annually. But if the direct pressure be thus heavy, it is Mr. Heathfield's object to shew, that the corresponding relief, to be indirectly obtained, would far more than compensate it.—The demand for agricultural produce, says he, is chiefly the demand of the manufacturing population; the industry of the country is stimulated and sustained by the industry of the towns; and the industry of the towns is regulated in extent and productiveness by the state of the foreign markets for which the product is destined. The innumerable duties and exactions which it is the object of Mr. Heathfield's plan to abolish, narrow the foreign market by abridging the ability of the British manufacturer to compete in it; and this decay of foreign trade reverts upon the landholder by the destruction of the industry of the towns, and of the consequent power of purchasing the produce of the soil. If Britain were independent of foreign commerce, the advance of price on any one article produced or manufactured at home, would be compensated and adjusted by a similar advance in all the other articles against which it might be exchanged; a nominal advance affecting all articles, without any relative alteration of their *real value*, would be the simple result. But the case becomes

widely different, when you are forced to compete with those who do not share with you the common burden of a great taxation, and who are able, by withdrawing their demand, to extinguish that manufacturing industry upon which the prosperity of agriculture mainly depends.

The price of corn, as compared with the other products of capital and labour, is regulated, in the first instance, by principles which it is unnecessary at present to explore; but Mr. Heathfield endeavours to explain the mode in which this relative value is first disturbed by the imposition on any of the productive classes, of a new burden or tax, and ultimately adjusted, so as to divide the burden in equal proportions among all the productive classes. The class that is first and immediately burdened seeks relief by a rise of price—this rise is met by a similar advance in the price of other commodities, until the impost comes to be equally shared by all who either produce or consume, and who are subject to the authority by which the tax is imposed. The tax in this manner incorporates itself with the money-price of the commodities on which it falls—the party immediately assessed has raised his prices so as to afford him indemnity against the effects of the tax; but the indemnity is nominal only, not real to the full extent, for he pays his proportion of the tax in the advanced price of the commodities which he purchases, and of which the producers or manufacturers have been seeking their share of the common relief by enhancing the price. But there is a limit to this relief imposed by the conditions of foreign trade—and when that limit is passed, the stagnation which ensues, throws back the impost as a burden on the class upon whom it was primarily imposed, who have no longer the power of removing it, even in part, from their own devoted shoulders.

All public annuitants, whatever be the dignity or usefulness of their functions, from the sovereign himself downward, have, in Mr. Heathfield's opinion, that influence upon price and upon production which has been stated; but there are many classes of them who, as their adequate support and splendour are necessary to the highest objects for which society was instituted, are common of course to all nations, and who do not, by the exactions required for their support, affect commercial intercourse or relative productive power; while there are other classes of annuitants, such as the public creditor and the poor, who, existing in England in numbers, and preferring claims upon the public industry to an extent unparalleled in any other kingdom, have repressed the spring of commercial enterprise, and by creating a revulsion from abroad which

has overwhelmed the artisan, have sapped the very foundations of agriculture, and extinguished the liberal and effective demand by which it was sustained.

"The successive charges," says Mr. Heathfield, "in respect of the public annuitant and capable poor, *have at length affected the land* in far more than the ordinary relative proportion. The maintenance of the clergy is derived, chiefly, *direct* from the land; the maintenance of the poor is derived, chiefly, *direct* from the land; and the land contributes freely to the public revenue.

"The whole of these aggregated charges, is evidently *not now incorporated in a money price*, and the proportion *not so incorporated*, is not only *partial, but entire loss to the cultivator* *.

"Until the latter accumulations of the public debt, the increase of the class of public annuitants *was* followed by an advance in the money prices. The successive advances in money prices *have had*, even the *semblance* of *prosperity;* a *rising* market, rising in money price, although falling in effective value to the cultivator †, has been favourable to speculation; markets *have been* "*brisk;*" each successive year, the farmer, in his returns, has *counted more money*, and if, working upon a lease, has really, *at the expense of the proprietor of the farm*, derived a benefit. These are circumstances which have perplexed and misled the country; but it is in the nature of evil to work its own exposure, and it is not now possible to mistake the character of a public debt.

"The incapacity of the cultivator to advance the money prices of agricultural produce, or to maintain sufficient prices to effect the equal distribution of the latter imposition of annuities and the rates for the maintenance of the poor, has for some time past been apparent. Legislative measures have, in consequence, been resorted to at a heavy sacrifice of the principles of public economy, without adequate effect. Further measures, similar in kind, and at a fresh expense of principle, are called for. On either hand distress presents itself: to comply, is to sacrifice the land in the injury to manufacturing industry; to refuse, is to leave the landed proprietor without hope. The crisis displays the effect of artificial contrivances and of resilience from principle, in the most distinct and effective point of view. If it had been possible to have succeeded in finally eluding or counteracting the effects of a departure from first principles, the industry, the enterprise, the constancy, the ingenuity, the skill and the energy of the inhabitants of the British Isles would have been equal to the purpose." Pp. 16—18.

* By the words "cultivator" and "grower" as used in this Tract, both landlord and tenant are to be understood. In a national view, the interest is one; the division or distribution of profit or loss, between themselves, does not vary the general question.

† Falling in effective value to the cultivator, because the increase of the class of annuitants and of the poor, to be supported by the productive classes, of which the landed is the chief class, necessarily leaves less for the support and maintenance of the productive classes. The alteration of money prices may lead to miscalculation, but *cannot* prevent that final effect.

Mr. Heathfield considers it as no unimportant recommendation of any measure for liquidating the public debt, that the loss sustained under every system of taxation, beyond the amount of the exactions which actually find their way into the public exchequer, would thereby be saved. He recapitulates the objections commonly urged to the *indirect* system of taxation—a system which political economists, however, have generally concurred in pronouncing to be the best practicable one, when confined within reasonable limits. He estimates the compensation fairly or unfairly exacted by the different classes of dealers in consumable commodities on account of their advance of the tax, at 25 per cent. of its amount; and this compensation he refuses to consider as *profit* upon capital, by a distinction which appears to us rather more ingenious than sound—viz. that it is not for the *employment* but the *risk* of capital that the compensation is exacted and paid. Upon this ground he maintains, that 25 per cent. must be added to his original statement of the amount of relief which the nation is to gain by the operation of his first grand experiment for liquidating the debt; and estimates that taxes paid by the consumers will then cease, to the extent of thirty-six millions.

"The effect of this vast extent of relief," says he "could not fail to be so felt by every description of proprietor, as to render the proposed liquidation of the debt, a measure not only desirable in the highest degree, in which any object of social interest can be desirable, but of great practical facility: for the more distinct view and evidence of which, the several classes of proprietors will be considered, separately, in the order already stated.

"The cultivator of the soil is the first and the last object of legislation, and the distress of the cultivator is the pressing and immediate ground for desiring the liquidation of the public debt: the protection and encouragement of the cultivator, are the commanding reasons for prosecuting that object to the final extinction of the debt. The security of the cultivator is a principal ground upon which national loans are objectionable, and the assurance to the cultivator of a *liberal* return, is the first object to be proposed in the remission of duties and taxes.

"If, for instance, it be supposed that ten shillings for the bushel of wheat, and rateably for other grain, be necessary to the adequate compensation of the grower, and that the price of wheat be eight shillings only, for the bushel, and rateably for other grain: in this case, the earliest measures ought to embrace relief to the cultivator, equal to two shillings in the production of a bushel of wheat, and rateably as to all other grain; that is to say, before the reduction of the price of grain *.

* The illustration is limited to grain, because the insufficiency of price is felt, principally, in respect of grain, but it may be carried further, at the will and according to the information and judgment of the reader.

"The sum to be *contributed* by the proprietors of the cultivated lands of England and Wales, is estimated at one hundred and twelve millions and a half, or five millions six hundred and twenty-five thousand pounds annually.

"The immediate or early *beneficial results*, to be anticipated by the landed proprietor, are,

"The conversion of a *nominal*, into a *real* rent.

"The great reduction in respect of personal and domestic expenditure.

"The deprivation of excuse to the *employed* peasant, for application for parish or public assistance.

"The opportunity of obtaining relief from the burthen of maintaining the *unemployed* capable poor.

"Under this view, it is difficult, if not impossible to suppose any case, in which an English estate would be exposed to difficulty, *as a consequence* of the proposed impost.

"If the proprietor possess the means, either as a public annuitant, or otherwise, without having recourse to his landed property, of paying the principal sum assessed; his estate may be relieved, the country be relieved, and an equal amount of the public debt be extinguished for ever, with simplicity and ease.

"If the proprietor *do not* possess such means, but be limited to the means which his estate, alone, presents for the payment of the sum assessed, or the interest thereon; he will pay the interest on the amount of the assessment, until convenient to pay the principal sum.

"The lands of England are, now, declining in power to yield rent: and if the consideration be limited to the farmer being enabled to pay the present nominal rent; sufficient inducement and facility are presented for the payment by the proprietor, of the interest on the amount of the proposed assessment: and to this consideration are to be added the *great* reduction in personal and domestic *expenditure*, and the anticipated reduction in parish rates.

"If an estate be let for £1000 per annum, and be valued at £25,000, or twenty-five years purchase; the principal sum assessed would be £3750, or annually, one hundred and eighty-seven pounds ten shillings.

"In the present state and progress of affairs, what premium would assure the payment of the rent? Is it to be conceived that taking the average of all England, the payment of the rents could be assured at a premium of twenty per cent.? And if paid, and again expended, what proportion is expended in parish rates, and indirectly, through the medium of consumption, to the revenue? These questions cannot be *accurately* answered; but the advantages to the proprietor are too obvious to admit any question of difficulty in this case. It is not only fair to calculate that the proprietor would be enabled to pay the annual interest on the assessment, but probably, would further, be enabled to reduce and eventually to complete the payment of the

principal sum assessed, by means of annual accumulation, without altering his scale of living.

" If it be supposed that the estate be under mortgage, the adoption of the measure becomes the object of more anxious desire. In the instance of an estate worth £60,000, under mortgage for £40,000; the great effect of the incidental relief would be experienced by the *mortgager*. Upon him, the effect of the earlier deficiencies of rent would fall, over him the risk of foreclosure and sale (through his inability arising from the nonpayment of rent) impends; the relief in respect of the whole estate, is the relief of the proprietor, and the relief in respect of his personal or individual expenditure, is, also, proper to himself. The *price* of that great range of benefit, so long as the mortgage continue, must be borne to the extent of two-thirds, by the mortgagee. The whole class of property under mortgage, would therefore, be assisted and relieved in a peculiar and unexpected manner. It is not possible that objection or difficulty can arise on the part of this description of proprietor.

" And the mortgagee would have sufficient motive for the cheerful payment of the contribution to be required of him, *if he expend the income of the mortgage within the kingdom*, in the great relief which *he* would experience in the removal of the general burthens. If the mortgagee do *not* expend the income of the mortgage within the kingdom, or do not expend it *any where*, the advantage of the measure must be seen still more forcibly, *in the subjection to contribution of a class of persons, who would, otherwise, receive large advantages under the social compact, without making any social return* *.

" It would of course be necessary that provision should be made in respect of entailed and settled property, as in the instance of the redemption of the land tax.

" The sum to be contributed by the proprietors of the cultivated lands of Scotland is twenty-two millions and a half, or annually, one million one hundred and twenty-five thousand pounds.

" By the proprietors of the cultivated lands of Ireland forty-five millions, or annually, two millions two hundred and fifty thousand pounds, and excepting relief from the charge of maintaining the poor, the considerations which have been suggested with reference to the proprietor of the cultivated lands of England and Wales, apply in like manner to the proprietor of the cultivated lands of Scotland and Ireland.

" And the same considerations, excepting as to some points of detail in respect of minerals and timber, apply to the tithes belonging to the laity, to mines, minerals, canals, tolls, timber and fisheries; the collective assessment whereon is estimated at thirty-two millions two hundred and fifty thousand pounds, or annually, one million six hundred and twelve thousand five hundred pounds.

* The mortgagee, might perhaps, attempt to throw the whole of the contribution upon the proprietor, which if necessary might be guarded against by legislative provision. See Property Act, 46 Geo. III. c. 65. § 195.

"And also to dwelling houses, the assessment whereon is estimated at fifty-one millions, or annually, two millions five hundred and fifty thousand pounds.

"*The principal of these several sums, which amount to two hundred and sixty-three millions two hundred and fifty thousand pounds, would be redeemable, with only trifling exceptions, at the will of the proprietor* *." Pp. 26—33.

After noticing the cases of agricultural stock and commercial property, the author proceeds,

"Under what head, then, to what class of property or proprietor, is difficulty to be assigned in the operation of the measure proposed for the liquidation of the public debt?

"The actual difficulties of the country are felt by the strongest minds, with a deep conviction of their severity, and the keenest apprehension of consequences. But what consequence to which the epithet 'difficult' ought to be applied *in respect of a great national object*, can be apprehended, either to the collective body, or to any individual, from the measure under consideration?

"The stockholder who does not expend the annual produce of his stock, or who expends his income from stock in another country, escapes from the burthens, and out of all sympathy with the distresses of the country. The landed proprietor who expends in another country the rent which he may receive, or who invests his rent in the purchase of government annuities†, also avoids the national burthens, in respect of expenditure, but not in respect of property. The national imposts continue to bear upon his land. With these exceptions, the proprietor, including the public creditor himself, is, in effect, debtor to the public creditor: the *property is burthened with the debt*, and it is not possible, without adding to the class of exceptions already mentioned, to prevent the individual consequences. The burthen *cannot*, by any ingenuity, be removed to the non-proprietor: the non-proprietor may be oppressed, may be incapacitated, in the attempt to divide the burthen with him, but the re-action from his distress is felt in the accumulation of burthen on the proprietor: the *activity* and the *comfort*, the *exertion*, and the *actual consumption* of the non-proprietor, are the stay and invigoration of property; his decline is the decline of the proprietor. Every impost upon the consumption of the lower classes, every check to industry, lowers the active energy which gives value to property, and tends to repress the sense of independence, which is the foundation and only sure protection of moral worth.

"Comprehensively considered, the proprietor, including the stockholder, pays the public annuities, sustains the burthen of the sinking fund, so far as it is sustained; endures the heavy burthen of expense

* Should it be observed that the stockholder would be left in uncertainty as to the time of payment, it is to be considered that stock would continue to be the subject of transfer and sale until finally paid and discharged.

† Thereby replacing the capital of stock-holders, who may invest such capital in anoth er country.

incident to the attempt to manage the unwieldy system, supports a large proportion of the population *in a state of vice and wretchedness*, and in the result, property is reduced, *by the mere effect of an artificial system*, particularly the land, to a condition of great difficulty and embarrassment.

"And yet, what is more demonstrable than that the British Empire contains within itself mind and matter, in almost every variety of character and combination necessary to individual and public prosperity? The strength and force of character which British seamen and British soldiers have every where displayed, are evinced daily in the constancy and firmness with which the vast masses and combinations of machinery are worked and conducted: moral courage and fortitude of spirit, are as necessary in the arduous pursuits of industry as on the ocean or in the field. The inventions and arrangements of the spinner and manufacturer, which, *under penalty of ruin*, must be *strictly practical*, are the results of the most severe and anxious exertions of ingenuity. The nobility and gentry are the patrons and example in the first of human pursuits, the culture of the soil. The empire is perfect, or nearly so, in the possession of most of the varieties of climate, and soil, and presents, within itself, the means of extensive interchange in nearly all the varieties of natural and artificial productions. EACH member and division of the empire is a market for the natural productions, and for the products of the skill and industry peculiar to each.

"It is not, therefore, to be doubted, that the landed proprietor of this great and favoured nation is entitled to a liberal return from his property, and that he *would* receive such return, if artificial causes did not intervene and embarrass.

"The spindle, the loom, and the anvil, are constructed and are employed with a view to the immediate benefit of those who render them active; but the permanent and most desirable *effects* of these branches of national industry and exertion are experienced by the landed proprietor. The landed proprietor has been a great example to his tenant, and by his enterprise and judgment, and attention to the economy of his neighbourhood, has contributed his fair contingent to the demands of the country; but the consideration of the invention and labour of the machinist and manufacturer solve the problem of the financial resource and power of the nation during the late contest; and the same fertility of invention and habits of labour, unfettered by artificial public arrangements, and unembarrassed by *a population, excessive, with reference to the demand for labour*, would be powerfully instrumental in conveying to the landed proprietor, and to all who are dependent upon, and connected with him, the full compensation to which each in his degree is entitled." P. 37—41.

Mr. Heathfield then proceeds to point out the mode of operation, and the immediate effects of his plan.

"If the proposed measure should be adopted, the following may be considered as its operative course.

"The sinking fund would immediately cease, together with the train of charges incident to that arrangement.

" The amount proposed to be applied to that fund, is	5,000,000
" Fifteen per cent. on the amount of annuities and interest, payable in respect of the public debt, deducting the amount supposed to be payable to foreigners, would likewise cease, being	4,400,000
" And also,	
" Fifteen per cent. on public appointments, estimated, together with the decline in the price of stores for the public service incident to the reduction of duties, at*	4,000,000
	13,400,000

" In round numbers, *gross* revenue, fourteen millions per annum, for which there would not be any further demand.

" It is *not* stated that fourteen millions would be required from all, or any part of the community, *in any other form.* The country would be absolutely released from demand for duties, or for duties and taxes, to the amount of fourteen millions annually, upon the condition that a *further* sum, namely, fifteen millions duties, or duties and taxes, should be commuted for a property tax, redeemable at option in respect of two hundred and sixty three millions two hundred and fifty thousand pounds, and redeemable compulsorily, in five successive years, in respect of one hundred and eleven millions seven hundred and fifty thousand pounds, and that the public creditor should relinquish an annual claim of four millions four hundred thousand pounds.

" Upon the commutation of fifteen millions annual-duties, or duties and taxes, for a direct redeemable property-tax of equal amount, and the remission of claim, at the rate of fifteen per cent. by the public creditor, not only such fifteen millions duties, or duties and taxes, might be repealed, but also fourteen millions duties, or duties and taxes, *more, which in such case would cease to be required;* together, twenty-nine millions.

" It has been shewn that the duties of customs and excise carry a train of immediate consequences into trade, which force up the amount paid for duties to at least twenty-five per cent. advance to the *consumer,* on the sum *paid to the customs or excise board,* and that the remission of duties to the extent of twenty-nine millions would, therefore, be relief to the country from the burthen of at least thirty-six millions; and that great sum of relief would *precede* the levy of the sum of fifteen millions†.

* The revenue required for the current service is twenty-two millions.

Fifteen per cent. whereon is - -	3,300,000
Add for further anticipated reduction in price of stores -	700,000
	4,000,000

† The burthen of thirty-six millions is *now* to be sustained, without the advantage of any beneficial re-action, in respect of British income expended in foreign countries, or in respect of British income, which may be the subject of annual accumulation. The *proposed contribution* would be paid by *all* persons entitled to British income. The *difference of distribution* of the burthen of the sum to be contributed by way of contribution is, therefore, to be considered, as well as the reduced amount to be required.

"It will probably be observed, that the preceding statement is defective, because the new taxes, 1819, are understood not to have been productive to the extent of three millions, and because the revenue may be deficient in other respects.

"It may be replied, that, if the new duties on tea, coffee, pepper, and other articles, have not been productive to the extent calculated, the reduction of *the rate of duty* would not be the less felt by the actual consumer; and if the actual produce of the revenue for the current year should not admit of the application of five millions to the sinking fund, it is to be considered that the claims upon the country remain the same, and that the greater the deficiency of revenue, the greater the necessity of adopting a system by which, upon principle, the claims upon the country may be reduced.

"The revenue which would apparently be required, after the application of the principal contribution of fifteen per cent. on property, (continuing to estimate that contribution at the amount already assumed) would be as follows:

"*Nett revenue* required to pay the dividends on remaining stock and annuities for lives and for terms of years . 13 Millions.

"Present amount of nett revenue required for current service . . . . . 22 Millions.

"Allow for reduction of fifteen per cent. and reduced price of stores . . . 4———18 Millions.

"Total nett revenue to be required . . . 31 Millions.

"This sum of thirty-one millions would not be increased, whatever may be the deficiency of public income upon the present system, but would be subject to reduction by the gradual and final extinction of the amount of stock, 350 millions, and annuities for lives and for terms of years, one million eight hundred thousand pounds, in respect of which, the annual sum of thirteen millions is entered in the statement.

"The means suggested for this purpose are, an impost on British Colonial and Asiatic property for a term of years to be limited, so far as such property can be subjected thereto; in effect, an income tax.

"The appropriation of any eventual surplus of taxes.

"The amount of stock which may for ever remain unclaimed.

"The probable greater amount of the private property, than 2500 millions.

"The expiration of annuities for lives or for terms of years*." P. 41—46.

The author then proceeds to remark on these particulars in detail, explaining the facilities which in his opinion exist for subjecting colonial property to contribution; but confessing, at the same time, that the supposed surplus of the aggregate property of the empire cannot be relied on,—while his other sources of

* It is also suggested, Elements of a Plan, &c. p. 19, that the impost of 15 per cent. might be continued in respect of property *to be* acquired within the United kingdom, after the deduction of all expenditure, until the final liquidation of the debt, but it does not appear to be probable that recourse to that measure would become necessary.

revenue from annuities falling in, will not be fully available till the year 1860. He next discusses the question as to the *rate* at which the various denominations of stock are to be purchased up under the operation of his plan—deciding for a small advance or bonus on the lower denominations of stock, so as to realize, in some degree, to the holders, the benefits which they might reasonably expect from the ordinary fluctuations of price,—but rejecting, although with some hesitation, the principle, that they are entitled to payment at par, upon the ground that, when they made their purchases, such a measure as a general liquidation could never have been contemplated by them, and that to have not their real but their imaginary rights consulted, so as in effect to exempt, and more than exempt, them from co-operating in a great measure of national renovation, is more than they can justly expect from the legislature or from the country.

We must refer our readers to the work itself for the dissertations, which the author has thrown into an appendix, upon the interesting subjects of pauperism, emigration, the establishment of banks of deposit, &c. and hasten to notice his reply to the objections which we ventured to state on a former occasion; the question as to the *practicability* of the plan being not only the previous question, but, as we humbly think, one much more difficult to be resolved than that which relates to the *benefits* to be derived from it if once happily realized.

Mr. Heathfield has, generally speaking, stated our objections with accuracy—and if in any instance he has failed to do so, we ascribe it at once to our own hasty and imperfect explanations on the points at issue. He says, we described his measure as *inefficient;* his answer is, "The permanent relief which would *precede* all demand in respect of the proposed impost, including the advance on the duties of custom and excise, charged by dealers to the consumer, would amount to at least thirty-six millions annually, which sum is more than sufficient to establish the *efficiency* of the measure if carried into effect." We meant, when we described the measure as inefficient, to say, that it was relatively so, because it did not contemplate the total, but only a partial *certain* redemption of the debt, leaving the remainder to be wrought upon by casual resources. Here is a great, complex, and most hazardous experiment—and undertaken for what? Not for the *entire* liquidation of the debt, and the renovation of the public finances—but to leave the nation still burdened to the extent of 350 millions Sterling. Something might have been hazarded for the sake of a *total* redemption—but the sudden transfer of nearly 400 mil-

lions of property, is not to be risked for an inferior object. If the property be not actually transferred, interest is, according to Mr. Heathfield's plan, to be paid on the amount;—and what is this, in truth, but to vary the form, without removing the burden of taxation? Till the property be, in one way or other, transferred—till the public creditor have his principal repaid, you must, in one shape or other, pay him his annuity. How then does Mr. Heathfield shew that the relief from taxation *can* precede all demand upon the property? While the interest continues to be paid, taxation has not ceased; before the interest ceases to be paid, the property must be transferred.

"On the supposition," says Mr. Heathfield, "of the *prece-*
"*dent* relief of the nation from a burden of thirty-six millions,
"and the consequent quickening of the active powers of the
"country, it is difficult to suppose any extensive class of cases
"in which either *forced or disadvantageous sales of property*
"could become necessary for the purpose of meeting the object
"of the proposed measure; common prudence of conduct being
"supposed, with what description of persons could the necessi-
"ty arise?" We do not well understand what the author means by *precedent* relief; although the strength of his whole reply to us lies in this hypothesis of antecedence. Does he mean relief preceding the actual payment of the principal to the stockholder? But how can this relief be found by the landholders, for example, whom Mr. Heathfield assesses, during the interval, at the rate of nine millions a year, and who must continue to be thus assessed for payment of the annuity, till the principal shall be returned to the public creditor? We perceive no relief here, except that which is incidentally derived from the alleged economy produced by a change in the *form* of taxation—a change which, if upon general principles it were thought advisable, might be otherwise adopted at any time, and has no *necessary* connection with the project of Mr. Heathfield. The public creditor, indeed, when he is assessed in *his* contribution of 15 per cent. relieves the country of taxes corresponding to the interest on that amount; but with his diminished income, will he not also abridge that expenditure which is the source of public revenue, and by means of which the public annuitant, in fact, contributes towards the payment of his own annuity? As to the rest, all remains unchanged; the debt exists—the interest must in some shape be paid—and the relief is in the change of form only, not in the absolute removal of taxation, which can be dispensed with only when that day of final

payment shall come, which Mr. Heathfield assumes that it will precede.

The author's reply, therefore, to our remarks as to the *practicability* of the scheme, which rests, in substance, upon the assumed relief by the removal of taxes, as preceding the period of actual redemption, and enabling all the classes assessed so to husband their resources as to be able, without any violent revolution of property to meet the day of payment, when it shall arrive, will lose its force if that *preceding* relief be not clearly established. We venture to think it is not possible to establish such a proposition—because so long as the capital of the debt subsists—and it must subsist till actually paid off—there must be regular provision for the interest, and there can of course be no antecedent relief.

The embarrassment, we also stated, would be great and incalculable, to the *receivers* as well as to the *payers*, the former not knowing how to employ the capital forced into their hands. Mr. Heathfield appears in substance to admit the force of this objection; and "upon these grounds," he says, "he has not "felt desirous of pressing the *whole* object into *immediate* exe- "cution." He proposes to leave a residue—and it is a large one —of the public funds, into which trustees, incorporations, and others, holding property in similar circumstances, may throw such property; he aims only at such an alteration in the condition of the public, as that instead of being an anxious and needy borrower *on any terms*, it may be able to prescribe terms to the lender. He is aware, in short, that there *are* classes of capitalists to whom the security of government is every way eligible; and he proposes to provide for their case, by leaving a portion of the public funds untouched, although he must thereby grievously mangle his own project; and if this should not be found adequate, he looks to the establishment of banks of deposit for curing all that may remain of the evil.

But it was *not* to the case of trustees, incorporations, &c. alone, that we looked in stating the objection. The keenest and most active speculator may have capital beyond his means of employing, or his desire of risking it; and the fact, that much capital is by such persons invested in the public funds, of itself establishes our position. Such persons, therefore, when they are *forcibly* repaid, will be encumbered with capital which they cannot conveniently employ; and if Mr. Heathfield's conjecture be just, that the repayment will take place out of accumulations derived from *antecedent relief* to the contributor, it is obvious that the sudden transfer of capital into hands not adapted for

its direct employment, will not be mitigated by any correspondent demand for loans. But the establishment of banks of deposit would be practicable only on the supposition that such a demand should arise, without which a bank of that description cannot exist. The objection, therefore, was far more extensive in its nature than Mr. Heathfield seems to have supposed, and embraced an amount of capital, and a variety of interests, for which his plan can never provide without an abandonment of its principle.

But Mr. Heathfield, by the description which he gives of his measure in the following passage, substantially admits the objections we urged against it, and by stripping it of its pretensions as a plan for the liquidation of the public debt, virtually owns that any such plan, considered with reference to immediate execution, is really visionary.

"It is sufficiently plain that all immoveable property is deeply mortgaged to the public creditor. It is proposed that this general, undefined, and overwhelming mortgage, be reduced and defined in respect of the principal part, as a mortgage (without the *form* of a security) to the extent of fifteen per cent. on the value of property, and that until the mortgage be redeemed, interest after the rate of five per cent. per annum, be paid on such amount. That is the true character and definition of the proposed measure: call it a redeemable property-tax, or a defined mortgage, with great facilities for the redemption, the measure remains the same." P. 112.

So that Mr. Heathfield proposes, after all, only to localize and define, but not suddenly, or within any definite period, to liquidate the public debt—and the result, therefore, of the whole project is only to attach to *existing* property that burden which now hangs over all property and all industry—to alter the distribution, but to allow the absolute pressure of the load to remain unabated—to relieve the professional man, for instance, at the expense of the proprietor—an objection which we formerly stated, and to which Mr. Heathfield has, made a very inadequate answer. "Neither professional nor any other service "which may now be adequately compensated," he observes, "would be entitled, if the public debt were liquidated, to com-"pensation after the rate now paid." But he seems to have forgotten that the change to which he alludes here, would be nominal not real—that the same nominal fall of price would affect all the holders of property in common with those who exercise professions—and that, besides this common and merely nominal change, the proprietor or capitalist would have paid his 15 per cent. on the value of his property, while the professional man, *now* equally liable with him to the burden of taxes, will not have

contributed one farthing towards the redemption. This is not an equable change, but a very serious revolution in the relative states of these classes whom the law, as it stands, endeavours to embrace in a fair and equal contribution.

We are sure our readers will do us the justice to believe, that we have not been seduced into the latter part of this discussion from any feelings personal to ourselves, or with any view but to the elucidation of this great question, which now engages, and is likely still more to occupy, the attention of the country. We have only to add, that the perusal of this new effort of Mr. Heathfield's, while it has confirmed our good opinion of his talents, has not removed our scepticism as to the practicability of his plan.

Art. V. *Proposal for establishing in Edinburgh, and other towns, a newly improved Apparatus, for the application of the Vapour of Water, Sulphur, and other Medicinal Substances, found so efficacious in the Cure of Rheumatism and Diseases of the Skin; with a Paper upon the Subject, which has been submitted to the perusal, and received the approbation of Dr. Hamilton, Sen. Dr. Gregory, Dr. Barclay, Dr. Farquharson, and Mr. Bryce.* Edinburgh. Waugh and Innes. 1820. Pp. 69. 8vo.

Medicine, though it be one of those sciences which have been longest and most extensively cultivated, still remains in an imperfect state, and is certainly quite inadequate to human hopes and wishes. These, no doubt, are often so unreasonable, as to appear almost to claim from the exercise of the art, exemption from the final and inevitable lot of man; but at the same time, it is notorious that various cases of human suffering are daily occurring, to which the skill of the physician can administer only a scanty relief. To this may be ascribed the multiplication of supposed remedies,—for, in addition to the legitimately ambitious efforts of professional men, whose interest it is, individually and conjointly, to enhance their title to public confidence by the improvement of their art, there is always a goodly number of persons in the community, who, be they purely benevolent, simply conceited, or fraudulently selfish, are accustomed to glean in the field of discovery, and to show their *eureka*

on the slightest occasion. Medical men are commonly supposed to be jealous of such intermeddlers, and to act unjustly towards their pretensions and success. The fact, we believe, is, that medical men, more especially if they have practised a dozen or twenty years, are a very sceptical race of beings, or at least are by no means liable to any great superfluity of belief, even when the most respectable members of their fraternity solicit its exercise. They require the proposal of a new remedy to be both reasonable and consistent with the established principles of science, and, at the same time, sanctioned by the testimony of those whose acquirements and opportunities have made them competent judges. Nay, even such concurrence, sufficient as it may be to warrant an appeal to experiment, is not sufficient to warrant any thing more. A good deal of observation and inquiry must also be instituted, in order to detect those incidental circumstances which may have influenced any particular result; as well as to ascertain what are the conditions of the animal economy in which the substance may be safely and efficaciously exhibited—ere the principles of sound philosophy authorize its adoption into the list of remedies. How defective in these preparatory recommendations are the specifics of the *infallibles* may be easily understood, from the single fact of their composition being studiously concealed—as if the fabricators endeavoured, so far as they had power over nature by their sophistical chemistry, to debar the approbation of honest men. On the other hand, it cannot be denied, that as the members of this profession are, generally speaking, abundantly liberal of their services to humanity, so they are rarely remiss in prosecuting to a judicious conclusion any plausible suggestions, come they whence they may, which are from time to time obtruded on their notice. Hence, in a great degree the endless succession of fashionable drugs, theories, and modes of treatment. But, perhaps, the memory of every man who has ever had the toothache, or whose limbs have been writhed by the agonies of gout or rheumatism, will furnish proofs of the abundance of sovereign remedies which brought him no relief, and catalogues of marvellous recoveries which did not comprehend his case—a very unequivocal demonstration, we imagine, that in the healing art, as in some other things, it is easier to acquire fame than to deserve it. Unfortunately this is not the only subject of mingled reproach and regret in the history of medicine. The officiousness of discoverers, and the celerity with which novelties are crowded on the public attention, to say nothing of the natural consequences of carelessness and mismanagement, have not unfrequently consigned to a temporary disrepute or oblivion what had really

been found useful. Examples of this kind are so numerous, and they are so evidenced by sundry beneficial revivals in our own times, that it may be established as a maxim, in defiance of what the pride of modern science may pretend, that there lies no objection against any practice or remedy, in the mere circumstance of its having become obsolete, or being for a time laid aside. Medicine has been much more advanced, in reality, by experience and observation, than by any discursive procedure of the reasoning faculty, or any progeny of what is called genius,—and hence it may safely be affirmed, that the writings of those practitioners, however early they may have lived, who faithfully recorded what they had seen and done, possess an intrinsic and an unalterable value, however defective or erroneous may be the theories and speculations with which the facts contained in them are combined.

These remarks may appropriately introduce to our readers the pamphlet now before us. It is the production of a gentleman who is not of the medical profession, but who, according to his own testimony, has found that the members of that profession can divest themselves of petty jealousy, and unite in support of a rational proposal, though, besides coming from an *alien*, it be necessarily conveyed in language which virtually charges them with neglecting an important remedial agent; and it has for its object, the restoration in an improved state, or rather, as it relates to this country, the introduction and establishment of a mode of treatment, which is known to have proved highly serviceable in former times and in other countries, as a cure for several diseases. A very brief notice of its contents is all that we think necessary to excite the public mind, so far as our influence extends, to a duly interested consideration of the subject, if not to decisive patronage.

The title page states a good deal as to the nature of the proposal, and we may therefore economize our remarks on it. An advertisement discloses the manner in which the proposal originated. The author, who is well known in this city by his endeavours to establish an Academical Institution for students of law and of medicine, having become acquainted with Dr. Gosse of Geneva, lately on a visit to this country, happened to tell him "that among other things he had often thought an establish-"ment where electricity, galvanism, cupping, and particularly "dry cupping, sea-water and medicinal baths, frictions of all "kinds, &c. should be employed according to the direction of "medical men, was much wanting in Edinburgh." This led to some information on the part of Dr. Gosse, relative to the efficiency and the construction of Dr. De Carro's improved appa-

ratus for vapour baths at Vienna, which Dr. Gosse considered to be by far the best in Europe*. Dr. Gosse, it seems, had previously spoken on the subject to many other persons, "but had not found any body disposed to take it up seriously, by sending to him a skilful mechanic, to whom he could describe the apparatus." He was more successful in the present instance.

"The author of these pages called upon Mr. John Carruthers, a mechanic whom he had long known to be a man of superior skill, and explained the matter to him, and told him that if he chose to undertake the business, the author would give him the best advice, and all the assistance in his power upon the subject, and would introduce him to Dr. Gosse. Mr. Carruthers undertook the business, and was repeatedly with Dr. Gosse; and from his verbal description, Mr. Carruthers not only made drawings, but also all his part of the apparatus, that Dr. Gosse might see it. Mr. Carruthers was then advised to submit the matter, first to the approbation and patronage of the medical men of this place; and he accordingly got an address to medical men printed and circulated among them. The author of this paper had wished to have done all he could in promoting this undertaking without being known in it; but circumstances occurred, which made it his duty to avow the part he had taken, and the approbation which the plan has, since then, received from the most eminent of the profession in this place, leaves him no cause to regret having done so."

A gentleman deservedly esteemed in his profession, Mr. Bryce, to whom the plan was first communicated, gave it his sanction; and, at his suggestion, a great part of this pamphlet was written, in order to secure the favour of other medical men. It was accordingly submitted to the perusal of Drs. Hamilton, Gregory, Barclay, and Farquharson, and Mr. Bryce himself, who all approved of it, and joined in opinion that it ought to be published. Various members of the profession subsequently patronized the plan by their subscriptions; and several of them, as we find, have expressed in writing their hearty satisfaction with the enclosed proposal. In consequence of this approbation, and in hopes of farther support, we are told that it is intended to open an establishment for the purposes mentioned, in the course of the present month (May). The manner in which this is to be conducted is specified, and we think affords reasonable ground for hoping that some important benefits will be the result of public encouragement—more especially as the intention is avowed, of extending its application to the poor, in the event of

* We formerly alluded, in the Review of Dr. Bright's Travels, to the excellent accommodations for bathing in that metropolis, and expressed a wish, as the reader may possibly recollect, that every large city possessed the convenience in an equal degree.

adequate subscription being obtained. For the particulars we must of course refer the reader to the pamphlet itself. But we may mention, for the sake of those who may not have an early opportunity of seeing it, that the greater part of it is occupied with references to, or quotations from, various authors, ancient and modern, who have either incidentally or at large treated of the medical effects of different kinds of vapour applied to the body. Some persons may be rather disposed to question the necessity for multiplying these so far as medical men are concerned; seeing that among them there does not exist the shadow of a doubt as to the utility of fumigation, and that many of them have sometimes had occasion to prescribe it, at least in the case of one disease; we mean that of syphilis. But all will allow, we believe, that he has shewn very considerable diligence in making his collection; and, for our own parts, we certainly feel indebted to him, for his anxiety to urge, by every means in his power, the adoption and extension of a practice, which has not hitherto been considered in this country with the attention due to its importance. As he purposes, we perceive, to continue the subject, and to insert cases in successive numbers, we would suggest to him the propriety of having the aid of a professional gentleman, of sufficient medical reading and good sense, to avoid unnecessary communications and immethodical prolixity. Sundry other cautions will probably occur to him, on a little reflection, as absolutely requiste to ensure the duration of that respect and patronage which the announcement of his plan has so readily obtained. The following extract is all that we deem necessary, either in justice to the pamphlet, or in testimony of the benefits to be derived from the practice which we have thus taken the liberty to recommend to the notice of our readers.

"The work which will have most weight with the medical men of these islands, is that of Dr. De Carro. "Sur les Fumigations Sulfureuses." Dr. De Carro graduated at this university (Edinburgh;) he is well known to some of the oldest and most respectable members of his profession in this town, to be one of the most accomplished men in Europe; and it is impossible for any educated man to read his work without being struck with the candour, love of science, perseverance, and anxious desire to render the noble profession of which he is so great an ornament, as extensively useful to his fellow-creatures as possible. He opened his establishment at Vienna, where he is in full practice, in the summer of 1817. He has published every case that had occurred up to the date of his work in 1819, amounting to two hundred cases of persons of both sexes, from five years of age to seventy-five, of whom many were very delicate, were considered as incurable, and given over by physicians Of this work Dr Gosse has published a very able analysis in the *Bibliotheque Universelle des*

Sciences, &c.; and he added some observations of his own, which are the more valuable from the circumstance of his having been an ocular witness of many of the cases that occurred during his residence of four months in Dr. De Carro's house. Thus Dr. Gosse tells us, that among those who were afflicted with the itch, or with an itchy eruption, twenty-two had been radically cured after a few fumigations, and four had derived benefit: thus hepatic spots, by which it is presumed he means *the alphoid* spots of Dr. Willan, had yielded with very remarkable facility in eight cases: that Dr. De Carro had an opportunity of treating six persons in this manner, affected with what he calls *des furoncles,* (boils,) which, with the greater part, were rather the result than the cause of disease,—two were quite cured—two derived benefit—the two last did not continue the fumigations. Out of thirty-nine persons tormented with rheumatism, sciatica, and anomalous pains, eighteen were cured, seventeen found themselves better, four were sent away without being benefited. Of gouty affections, and such as were mixed with rheumatism, the number of cases were (was) twenty-six, and the greatest part of these patients had suffered for a long time, or were afflicted with an hereditary taint. Seven were cured; fifteen much better; four without any benefit: one only had taken internal medicaments with the fumigations. Where œdematous swellings existed, the fumigations had dissipated them; and hence he concludes that they would be useful in dropsies, where no organic injury had taken place, as in anasarca succeeding scarlet fever, &c. Two Hungarian physicians, correspondents of Dr. De Carro, attribute to these fumigations a particular efficacy in diseases produced by arsenic and lead; but Dr. Gosse doubts if the action of lead can be diminished with so much facility as that of mercury, which appears to have a tendency to go to the surface of the skin. He says that the experiments made as to that subject upon gilders and hatters with the vapour of simple water, oblige us to consider the fumigations of sulphur as a specific against all the diseases produced by this metal."

Altogether, we may observe in conclusion, the success of Dr. De Carro's treatment of several diseases by fumigation has been such, as to attract the attention of medical men throughout various countries of Europe—in proof of which, it may be remarked, that in the course of fifteen months, there were no less than forty-eight orders for his apparatus, and that new orders were coming every day from different parts of the Continent, Austria, Hungary, Poland, Russia, Italy, &c. Let us hope that our own island will soon experience whatever benefits are to be realized from this mode of treatment,—and that our northern metropolis will, by a becoming ardour and liberality in investigating its merits, vindicate her far-famed excellence as a SCHOOL OF MEDICINE.

ART. VI. *Sketch of a System of the Philosophy of the Human Mind, Part First, comprehending the Physiology of the Mind.* By THOMAS BROWN, M.D. Professor of Moral Philosophy in the University of Edinburgh.

THE premature fate of the accomplished author of the work before us, while just entering on the most vigorous period of life, and full of ardour for the elevated pursuits to which he was alike invited by the duties of his office, and the propensities of his genius, imparts a melancholy interest to our present functions. It is known, that the devotion of Dr. Brown to the interests of science, and his unremitting toil in the composition of this work, had a visible influence on his health; and if they did not produce, certainly accelerated the ravages of the disorder to which he fell an early victim. Thus he was, even in the literal signification of the term, a martyr to science;—and the present volume, while it is the pledge of the constancy of his spirit, is the sad memorial also of the delicacy of the frame in which it was confined.

We are aware that metaphysical speculations are not popular, and that the stern spirit of reflection which they demand, is not readily yielded by readers impatient of restraint, and eager for excitement. We have been sparing, therefore, of such disquisitions; but the publication, by a Professor of Moral Philosophy in this celebrated University, of a work, from which he evidently anticipated a revolution in the science, is an occurrence of such magnitude, that we could not refrain from preserving some record of it, without expunging the Philosophy of mind from the list of subjects which criticism includes within her cognizance.

While, in the examination of the work before us, we shall not forget the respect which is due to the character and attainments of the departed philosopher, we shall endeavour to evince that feeling, by the signs which would have been most welcome to the liberal mind of Dr. Brown himself, who informs us, that with a "spirit of free, but reverent inquiry, he ventured, at all "times, to examine the truth or error, even of opinions that "have been sanctioned with the most general admiration, and "which he did not scrutinize less rigidly, for sharing the admi-"ration which others feel." It shall be our study to follow the example set us by the author, and to examine his doctrines with the spirit of which he has inculcated the soundness, and urged the impartial application. Should our conclusions appear to differ materially from those adopted by him, even

the readers who may be disposed to coincide with us, will find enough both of acuteness and ingenuity in this little volume, to confirm the esteem with which they have been accustomed to regard the talents of the author—while those to whom his character was more intimately known, will long remember him with fond regret, without seeking, in the qualities of the understanding, for the source of that regard which, in the case of Dr. Brown, they found abundantly in the virtues of the heart.

Dr. Brown prefers no ordinary claim to the merit of novelty in behalf of the speculations which occupy the present imperfect volume. He expresses himself freely regarding the systems hitherto most esteemed and followed in this branch of science, and the faults which have rendered it necessary to supersede them by juster principles.

"The great defect," says he, "of the system of philosophy of the mind, which has been generally prevalent in the northern part of the island, so as to distinguish it as the seat of a particular school of metaphysics, seems to me to be a redundancy of division, arising partly, indeed, from imperfect analysis of the complex phenomena of thought, which a nicer observation might have shewn to be in their elements the same, but still more from the indistinct notions attached to the words *faculty* or *power* of the mind, and to the processes that are termed *operations* or *acts* of those powers by which a sort of mystery has been thrown over the simple sequences of the phenomena of the mind, the relations of which to each other, or to certain bodily changes, are all which those words can be justly employed to denote." *Preface,* p. 10.

He farther observes, that we must consider

—"all our feelings, of whatever order,—sensations, thoughts, emotions, simply as *states* of the mind, that bear to each other, or to corresponding affections of our bodily frame, certain relations either of *reciprocal antecedence* and *consequence*, by which we distinguish them as causes and effects, or of virtual comprehensiveness, by which it is impossible for us not to regard some of them as complex, and involving, virtually at lesst, certain simpler feelings as their elements." *Ib.* p. 11.

It is the great object of the author, therefore, to discard the artificial divisions which have found their way into the philosophy of mind—to banish the prevailing misconceptions as to *powers* and *faculties*, *acts* and *operations*—and to illustrate the important fact, that in the study of the intellectual part of our nature, we discover only its different *states*, varying either as they are absolutely simple, or virtually complex; or as they present an appearance of *succession*, to which, in popular

language, we ascribe the relation of *cause* and *effect*, but in which the intellect recognizes only "*a sequence of changes.*"

In prosecution of his leading principle, the author endeavours to establish the substantial identity of the pursuits of physical and intellectual philosophy, so far, at least, as regards the mode of inquiry, and the character of the phenomena to be examined. Physical science has but *two* objects—to ascertain "the *compo-* "*sition* of bodies—and the *succession of changes* by which they "are made known to us as reciprocally causes and effects." The elementary atoms of bodies imperceptible to our senses, so long as they exist in a state of union, are separated and rendered palpable by the refined processes of chemical analysis; and it is by a similar process of analysis that we examine the complex phenomena of thought, with this distinction, however, that as all the phenomena, whether simple or complex, are equally states of a substance, that is itself simple and indivisible, the analysis is *virtual* only, not real, and embraces what the author terms a "seeming complexity," not an actual compound of which the parts can be resolved. But as to the other great branch of inquiry, viz. that which embraces the "sequence "of changes," the parallel betwixt physical and intellectual science is, in the author's opinion, complete.—Our firm and intuitive belief of the uniformity of the operations of nature—a principle not only independent of reasoning, but implied in all its processes—generates directly the laws of thought, by which we alike regard matter and mind as they present "sequences of "change," and at once produces and explains all that seems mysterious in our notions of *power* and *causation.*

"We arrange phenomena, accordingly," says the author, "not merely as parts of one casual sequence, but as *causes* and *effects*; or, in other words, as the invariable antecedents and consequents of the same phenomena in the same circumstances; and, expecting this uniformity of result, we invent the term *power*, not to express any thing distinct and separate from the antecedent itself, but to express the simple relation which we feel of its uniform immediate antecedence to a certain change—our undoubting belief, that whenever it has occurred, or may again occur, the event which we have once observed to be consequent, has always followed, and may always be expected in similar circumstances to occur again." P. 17.

The *virtual* resolution, therefore, of the "seeming complex- "ities" of the phenomena of mind, and the observation of the *sequences of change* which they present, constitute, in the opinion of this author, the only legitimate objects of the *physiology* of mind,—the phrase by which he has designated the speculations included in the present volume.

These general principles will be found to enter very deeply into the novel doctrines which have been hazarded by the author. But, before examining them, we wish to exhibit a brief but accurate analysis of the contents of the volume before us, taking care, in discussions of so much subtlety, to present the author's own words on all occasions when there appears to be any risk that we may have misapprehended his meaning.

The author's arrangement of his subject participates of the novelty which belongs to his principles. He first dispatches, as preliminary and unimportant, the subjects of "Consciousness" and "Mental Identity," which have made so great a figure in the speculations of other philosophers—he then advances to the doctrine of *Sensation* and *Perception*, and examines the foundation of our belief in the existence of matter—and finally treats of the intellectual *States* or *Feelings* of mind, as he calls them, which he discusses under the heads of "Simple and Relative Suggestion." The last subject, which is left imperfect, concludes the present fragment.

There is no distinct *power* of Consciousness, says Dr. Brown, for there are no *powers* of mind at all; there are only *states*; and Consciousness is but a name expressive of the whole variety of these states or feelings. "To feel is to be conscious," says he, "and not to be conscious is not to feel. I am conscious of a "particular feeling, means only I feel in a particular manner."

When we recal a feeling, even of the preceding moment, we exercise an act of *Memory*, just as much as by recalling events after a great lapse of time. The generic character of the faculty employed, or of the states of mind experienced, does not depend upon gradations of time—the whole phenomena of memory, whether we recal the most recent feelings, or the most remote events, presenting only these elements, viz. a certain feeling at the moment—the remembrance of another feeling, or state of mind more or less remote—together with a belief of mental identity, assuring us that it is the same mind which has existed in both states—a belief incorporated with every act of memory.

But whence this notion of Mental Identity? It is not derived from memory, or from reasoning; for it is implied in every act of memory, and every process of reasoning. It is vain to demand from reason the origin of that which reason has not produced, and never can explain—"the proudest results of demonstration itself," as the author remarks, "having their source in some proposition of "which we can give no other account than that it is impossible "for us not to believe it to be true." We have an irresistible, im-

mediate, and universal belief of our mental identity as often as we think of the present and the past. We may be disposed, indeed, to censure the philosophers who, by seeking an asylum in intuitive belief long before they had penetrated to the elements of knowledge, have multiplied first principles without end; yet we must not altogether reject the important truth, which they have only perverted, but remain contented with the evidence of *intuition*, when nature has truly denied that of demonstration.

On this subject of mental identity, the author has, however, raised a very singular difficulty. The mind, says he, is a substance simple and indivisible, without parts, and of course unsusceptible of change; but how is this hypothesis compatible with the phenomena which it presents, and by which alone we know its nature?—with the unceasing changes in its state from one instant to another—and the yet more palpable changes which mark the distant periods of its being, and transform the moral and intellectual character of individuals, till all notion of identity seems to be extinguished? The author, unable to grapple directly with the difficulty which he has created, recurs to the analogous phenomena of matter, and reminds us that the atoms of the material world, which would remain for ever at rest but for the intervention of impulse from without, undergo a change of their *tendencies*, upon the application of that impulse, without suffering any change of their *essence*.—But he forgets that the phenomena of motion itself remain an impenetrable secret to us, and that it is against all the rules of philosophizing to illustrate phenomena, in themselves dark and subtle, by others which are, if possible, darker and more subtle still.

After disposing of this preliminary matter, Dr. Brown proceeds to treat of *Sensation*. "In the process of Sensation," says he, "if we include what is corporeal of the process, as well as "what is mental, there are three necessary parts to be consider-"ed, the presence of an *external body*, an *organic change* im-"mediately consequent on its presence, a *mental affection*, as "immediately resulting from the antecedent organic change, or "series of changes."

But a curious question occurs. Is Sensation produced by the immediate agency of the external cause upon the nervous expansion at the organ of sense; or is the influence propagated onward to the central parts of the brain? We have no knowledge, Dr. Brown remarks, upon the subject, and are left altogether to conjecture. There is no evidence that the central parts of the great sensorial organ are immediately affected in sensation; because the change produced upon the nervous ex-

pansion at the external organ is sufficient of itself to account for sensation;—because the intermediate parts, so far as yet examined, do not seem well adapted to the rapid and subtle communication which a different theory implies; and, finally, because the hypothesis of an influence merely local, is more compatible than any other, with the fact of the *distinct* intimations given us by the different impulses, affecting the different external senses.

But there *are* facts which appear to contradict this opinion. When the nervous expansion at the organ has been lacerated, and the communication destroyed, sensation ceases: And those who have suffered amputation of any part of the sentient mass, still persist in referring to it the similar sensations which they experience after the part has been separated or destroyed. Dr. Brown disposes of these seeming anomalies, by remarking, that, when the nerve is cut, its functions are disordered, and sensation ceases, not from an interrupted communication, but a local inefficiency—while the mistaken references of sensation to parts no longer existing, is a proof only of the influence of *habit* in localizing the source of the mental change which is felt;—a view of the subject which is confirmed, he thinks, by the fact, that the local reference of mental feelings is no original part of sensation at all, but the result of experience alone, founded upon intimations derived from other sources, and by different organs.

The senses of Taste, Smell, and Hearing, the author thinks, give us no intimation of the existence of Matter. It is from the co-existence of the feelings derived from these senses, with the intimations of another sense, that we learn to ascribe the former to something external, which we denominate *matter*—and thus acquire all our complex perceptions.

On the subject of Touch, the author is very elaborate. "With "the exception of *warmth* and *chillness*," says he, "which, as "they have nothing peculiar to distinguish them from the va- "rieties of sensation before considered by us, the perceptions "ascribed to touch are only of modes of *extension* and *resistance*, "the very compound which we have in view in all our definitions "of matter." He then observes, "it is not to touch, as I conceive, "that either of these is to be traced. Our feeling of resistance, in "all its varieties of hardness, softness, roughness, smoothness, "solidity, liquidity, I consider as the result of organic affections, "not tactual, but muscular—our muscular frame being truly "an organ of sense that is affected in various ways by various "modifications of external resistance to the effort of contraction." By *hardness*, he adds, we mean "a tendency to resist compres-

" sion—a tendency to resist our muscular effort;" and, even admitting that the feeling is in part *tactual*, it is still chiefly muscular. It is to the muscular part of it, Dr. Brown thinks, that we specially refer, when we speak of the *resistance* of matter.

Nor does the sense of Touch, immediately and originally inform us of *extension* and *figure*. In proof of this the author remarks, that although when a hard surface is applied to the palm of the hand, a part of the organ is affected equal to the superficial extent of the body brought into contact with it; yet if we do not know the figure of that part of the hand which is affected, neither can we learn from this source the figure of the compressing body. If we *do* know the figure of the organ of touch, it is obvious that we have already that notion of figure of which the origin is sought.—If the sense of touch besides be the source of our notion of figure, it ought to give us distinct intimations of *every* species of figure—while there can be no doubt that an attempt to distinguish, by the sense of touch alone, a complex figured body would prove abortive.

The sensations of touch, the author farther remarks, become so much blended with the intimations of the other senses, and with our *muscular feelings*, that it is difficult to distinguish the parts of the complex process, and to refer to each element its proper share in the result. It thus becomes necessary, in making experiments on this subject, either to select bodies so small, as that the resistance to the muscular contraction becomes evanescent, or so large as that it shall be equalized over all the parts of the tactual organ.—It is the opinion of Dr. Brown accordingly, that the gentle application of a very minute body to the palm of the hand, would indeed give the sensation of *touch*, but convey no adequate notion of the *extension*, and no notion at all of the *figure* of the object—and that if you apply the palm of the hand to a surface larger than itself, and of the same temperature, so far from obtaining any notion of the figure of the body impressed, you will not even be able to ascertain the number of the fingers with which the surface is brought into contact.—It is *not*, therefore, to the sense of *Touch*, the author concludes, that we owe our notions of extension and figure.

He has therefore his own theory upon the subject, which he owns to be subtle, and expects to find opposed. He prefaces it by remarking, that, " in every attempt to arrive at the first " elements of our sensations, we must begin by considering the " circumstances in which the infant exists on his entrance into " life."—He is susceptible of various *feelings*, says the author; he is surrounded by an external world, capable of exciting these feelings; he has organs of sense, through which external objects

influence the mind; but he knows nothing of these organs, which to his mind are as much external as the other substances with which he is surrounded. He has the power, however, of *retracing his own feelings*, and of considering them as existing *in time,—as being parts of a series;* which forms, indeed, the essence of our notion of *length* or *duration*—a notion not primarily applicable to space at all, of which all the parts are coexistent. This notion of length, indeed, comes afterwards to be transferred to space, in consequence of the feeling of transition from part to part, which we experience in the survey of it; and hence it is that our measurements of space, which are not mechanical, are influenced by the succession of our *feelings;* a principle of mensuration not confined to larger surfaces, but extending even to the most minute, of which the superficial extent appears to be enlarged or contracted, according to the slowness or rapidity with which the tactual organ is passed along the surface.

Among the phenomena exhibited by infancy, the author continues, none is more remarkable than the tendency to frequent expansion and contraction of the parts of the hand. The infant, indeed, is yet unconscious that he has an organ to expand and contract, or muscular powers to exert; but he is *not* without the series of *feelings* created by the progress of the contraction from the instant that the extended fingers are moved inward, till they come in contact with the palm of the hand. He expects also that the repetition of the same muscular effort will on all occasions renew the same series of feelings; and when a hard body is interposed, he feels the series interrupted, in proportion to the magnitude of the body; and hence learns to measure that magnitude by the extent of the interruption. In this manner *time*, as indicated by the *sequence of internal feelings*, becomes the measure of *dimension.*

The infant, knowing from repeated experiments, that he can renew the muscular contractions, and the series of consequent feelings, by an act of the *Will*, and perceiving on the intervention of a hard body, that the series has been interrupted without any *internal* change in the state of the mind, necessarily refers the change to some *external* cause.—Thus we gather the complex notion of an *external* cause, which opposes *resistance* to muscular contraction, and which, as it breaks a *series* of mental feelings, must have *parts*—in other words, we have the notion of *Matter.* This complex notion is formed, too, by the mere operation of the fundamental laws of human thought, which equally govern the infant and the adult, and which, if they were not coeval with the first intimations of sense, and the earliest processes of intellect, no course of future education could develope.

There are other organs, Dr. Brown however admits, besides the hand and fingers, from which the same inferences may be derived; and he appears to us almost to abandon his theory, when he numbers the "*tactual feelings themselves*," as they arise *in succession* among the sources from which the notion of *time* and the consequent measurement of dimension may be deduced.

The author, therefore, while he rejects the opinion, that our belief in the existence of matter depends on an intuitive principle belonging to *Sensation* itself, admits, that it rests upon intuition no less firm and indestructible, belonging to the primary and fundamental laws of human thought.

Berkeley's scepticism, Dr. Brown thinks, was supported only by the unphilosophical transfer to mind of qualities of that very matter, whose existence the sceptical theory was intended to destroy; of the physical quality of *recipiency* in particular, with reference to *ideas* which were conceived as existing *in* the mind, and yet as something distinct from it. There is, in the author's opinion, but one philosophical species of scepticism as to the existence of the material world, viz. that which rejects the doctrine of ideas altogether, and considering Perception itself with the inferences deduced from it merely as *mental states*, and as including all, for which we have the evidence of consciousness, leaves the question, whether there be in nature a number of masses with qualities corresponding to our sensations impossible to be resolved by argument. To this view of the subject there is no answer, he thinks, except, that universal and indestructible belief, which is superior to all demonstration. The merit of Dr. Reid, therefore, in overthrowing philosophical scepticism, by subverting the ideal theory, is, in Dr. Brown's opinion, more than questionable; because that scepticism subsists best without the aid of the ideal theory altogether.

Dr. Reid moreover supposes, that *both Sensation* and *Perception* are necessary to make us acquainted with external objects, and the latter is termed by him a *power* or *faculty* of the mind. But, in almost all cases, "*Perception* is, says Dr. Brown, a *suggestion* of memory, and nothing more."—Taste, Smell, Hearing, give us no intimation of matter. But, when the notion of matter is once acquired, by the sense of Touch or otherwise, this *feeling* comes like any other, to blend by means of *suggestion* with our other feelings.—Even, if it be admitted, says the author, that in Touch there *is* a peculiar intuition called Perception, why discriminate this as a *faculty* more than any other intuition, since the phenomena of mind exhibit only a sequence of *states*, produced by the antecedent circumstances necessary for their development?

Dr. Reid has also misapplied, as Dr. Brown thinks, the term *object* in treating of perception,— a term by which he designated merely the external *cause* of that state of mind, and which does not, in the words of Dr. Brown, "express a relation different "from that relation of simple and invariable antecedence, which "is all that we mean when we speak of causation in other se- "quences of events material or mental."—The ideal theory had its origin, in the difficulty of accounting for the apparent Perception of objects *at a distance*—and for the reciprocal action on each other, as cause and effect, of substances so dissimilar as matter and mind. This last circumstance rendered it convenient to introduce "species," or "ideas," as a medium of communication partaking of the nature of both; but a better physical analysis has now proved, that there is *no* distant Perception; "and the other difficulty," says Dr. Brown, "vanishes "in like manner, when it is shown that causation does not im- "ply any intermediate link of connection, but is the simple re- "lation of one change that is invariably antecedent to another "change that is invariably consequent."

Of *Vision*, Dr. Brown remarks, that we see nothing but *light;* and that we learn from sight the magnitudes and figures of bodies only by their power in modifying the light which enters the retina.—The question how the small portion of light present at the retina enables us to discover the magnitude, figure, and position of distant objects, is discussed by the author.—In the inferior animals, this perception, he remarks, seems an instinct —in man it is the result of experience. The figure and dimensions of objects are recognized by Touch—the light which they reflect or emit, by the eye—these different sensations having often co-existed, it is agreeable to the ordinary laws of our intellectual nature, that the *feeling* of the one should suggest, as belonging to the same object, the feelings derived from the other, just as the sound of words suggests their signification.—Hence the anomalies in vision are easily explained. We see an object as *one*, whether we look on it with one or both eyes, because the *tactual* feeling suggested is but one; and although the image of the object be inverted on the retina, we see it *erect*, because it appeared so to the touch. Vision, therefore, imparts to us a vast variety of knowledge, not directly, but by the secondary feelings associated, and indissolubly blended with it, so as to appear to belong to its primary intimations.

Berkeley's distinction of *visible* and *tangible* figure, the former being co-extensive only with that portion of the retina affected, the latter being the magnitude which we actually perceive, is rejected by Dr. Brown; because we have no evidence of its

truth, and never were conscious of having perceived this *visible* figure; because the small image discovered on the retina of the eye upon dissection, cannot be the cause of our perception of figure, the nervous expansion in our other senses, which confessedly do not give any notion of *magnitude*, being equally impressed by their external objects; because the necessary co-existence in our maturer years of the sensation of colour, with the notion of *extension*, does not prove that the union is any thing more than the result of the feelings of suggestion already explained. At any rate, the colour co-exists with the extension of the *tangible* magnitude only, not with that of the visible, and can afford no proof that it is the visible figure which we perceive. Finally, that colour which, from the suggestions of touch, we are accustomed to ascribe to the tangible magnitudes, could never have been thus ascribed, if the only colour, and the only form which we perceive, were that small visible figure impressed upon the retina, of which the puny dimensions could never become commensurate with the vast and various coloured surfaces which we behold in nature.

Although it be necessary, the author observes, for the sake of arrangement, to consider our sensations as existing separately and in succession, they are very seldom actually simple, and uncombined with other feelings, of which the emotion of *desire* is the most frequent and powerful in its modifying influence, and has, in the systems of philosophy, made the most conspicuous figure under the name of "*Will*,"—implying, by that term, besides mere desire, a knowledge and anticipation that the desired result is to follow. We cannot, however, *will* a Sensation or Perception; but when "many objects of a single "sense are together present, we may *desire* to be impressed "with some parts of the complex perception in a more vivid "manner than with others"—a desire which uniformly produces an important result, since it is a law of our nature, that our passions and emotions vivify all the feelings with which they harmonize—and that, when of various co-existent feelings one becomes more lively than the rest, the others fade away and disappear—thus realizing all the phenomena of "*Attention*," for the explanation of which it is superfluous to create a specific *power* or *faculty*, since nothing occurs for which it is not easy to account, by referring to that provision in the economy of the mind, by which "what we wish to know becomes immediately, "on that very account, by the influence of the ordinary laws of "thought and emotion, more easy to be known."

We now advance to that part of Dr. Brown's work which pre-

sents the most prominent claim to originality, and to which the author evidently trusted the reputation of his system—the analysis and distribution of the "Intellectual States or Feelings" of the mind.

He begins by pronouncing a severe censure on Condillac and Reid—the former of whom, by representing all our feelings, thoughts, and emotions, as "mere sensations variously trans-"formed," has erred by an excess of simplicity—while the Scottish metaphysician, unnecessarily redundant in his divisions, has overshadowed the science by the crowd of imaginary powers which he has called into being.

Dr. Brown divides the *states* of the mind into *External* and *Internal Affections*, denoting, by the former term, the phenomena of Sensation; and, by the latter, what he terms "*Intellectual* "*States* of the mind and *Emotions*." The intellectual states of mind are only two: "Conceptions and Feelings of relation,"—and "our whole trains of thought," says the author, "if we abstract "from them the sensations which external objects may occasion-"ally induce, and the emotions that may frequently mingle with "them, will be found to be composed of these, and of these "alone."

Conceptions are not generated, nor are Relations "*felt*," at least as existing *in a train*, except upon some principle of connection. What is this principle? Dr. Brown rejects the doctrine of the "Association of Ideas," because the terms imply a mysterious union *of the objects themselves*, of which nature affords no trace—and because the supposed union is erroneously attributed to our *ideas* or *conceptions* alone, when, if it exist at all, it is common to them and to our *feelings* and *emotions*. Instead of this appellation, erroneous in theory, and improperly restricted in application, he adopts the term, "Suggestion," which he describes as either "simple" or "relative;"—"simple," when the phrase is used "to express nothing more than what is actually observed by us, in the readiness of certain feelings to arise after certain other feelings, as resemblances of former perceptions or conceptions, or other preceding states of the mind; and restricting the phrase uniformly to such simple sequences of the similar feelings, exclusively of all notions of relation of object to object, that may occasionally arise from them, and be intermingled with them,"—and "relative," when it is applied to that class of phenomena in which "the Perception or Conception of "two or more objects suggests or gives rise to certain *feelings* "*of relation*, which, as states of the mind, differ from the mere "Perceptions or Conceptions themselves that have given rise to "them, not merely as these Perceptions or Conceptions appear

"to differ from each other, but generically as a distinct order "of feelings."—The reader may not, perhaps, discover from these passages, in which the language of the author has been studiously preserved, that the mysterious science of the physiology of mind, has gained much by the discoveries of Dr. Brown in the clearness and precision of its phraseology; but if this author be not more luminous than his predecessors, let us see whether he be more just and profound.

Every one knows that the Perception of one object suggests the *conception* of many others; or, to use the language of the author, exercises the tendency of the mind to "renovations of feel-"ing"—that this renovating influence is not confined "to the "affections of sense," but extends to the Judgments formed, and the Emotions that have been felt—and that the suggesting principle thus governs not only our Conceptions, but our Opinions and Passions. "It could scarcely fail to be soon remarked," says the author, "that the suggestion is not wholly vague and "indiscriminate, but that certain conceptions are, according to "circumstances, more readily suggested than others;" Hence the attempt to reduce, under a few general heads, the laws which regulate the mysterious succession—an attempt for which Mr. Hume has challenged the praise of originality, but in which he had been anticipated by the most distinguished of the Greek philosophers.

Resemblance, Contiguity in place or time, Causation, and Contrast—the last of which Mr. Hume attempts unsuccessfully to resolve into some of the others,—are the laws assigned by that philosopher as regulating the association of ideas. But Dr. Brown objects, that, upon his own principles, "Causation "may be reduced to the head of Contiguity, of which it is, "in truth, the most exquisite example,"—and proceeds to reduce even Resemblance and Contrast to the same head, by a process of analysis, of which the subtlety is more remarkable by far than the soundness.

When objects *resemble* each other, says he, the common quality in which they agree must *co-exist* in each, with the other qualities in which they differ—and hence the Perception of one of the objects suggests the other, upon the principle of Contiguity: While, in the case of objects "strongly *contrasted* in "any quality, they must agree, at least in this one respect, that "they are both *extraordinary* in relation to that quality; and "the feeling of extraordinariness, with respect to the same qua-"lity that has attended the perception of both objects, may, "like any other part of a complex whole in which two objects

" agree, be sufficient to produce a reciprocal suggestion by the " influence of mere co-existence."

Did the author not perceive, that the common qualities of objects, are not therefore *identical*,—and that the reciprocal suggestion of these qualities could be the effect only of that Resemblance which he vainly endeavours to resolve into Contiguity? And, in the instance of Contrast, what could lead him to suppose, that the qualities contrasted are, of necessity, *extraordinary* in any other circumstance excepting the mere Contrast—that the extremes of colour, for example, considered separately, are more extraordinary than the intermediate gradations—or, that this *extraordinariness*, to use the harsh term invented for the occasion, consists in any thing else than that Contrast of which the singularity that occurs is the consequence not the source?—The author himself, indeed, has felt his analysis to be useless for all practical purposes—and, in prosecuting his inquiries, has been contented to adhere, in a great measure, to the established phraseology, and to acknowledge the laws of Suggestion, as existing in " Resemblance, Contrast, and former Proximity."

As a Supplement to these *primary* laws of Suggestion, corrective of their vague and indefinite operation, the author enumerates what he calls the *secondary* laws, under six different heads. The *duration* of the original feelings—their *liveliness*—their frequent *renewal*—their existence as *blended* with other conceptions, or experienced in a state *pure and unmingled*—the *constitutional differences* which distinguish individuals—Such are the principles enumerated by Dr. Brown, with no great perspicuity of arrangement, as modifying the primary laws of association, and out of the multitude of related objects or feelings, recalling those only in regular sequence, of which the relation is the most intimate, and the suggestion the most important for the purposes either of action or speculation.

The constitutional differences which distinguish individuals, and which create the phenomena of Genius, and the wonders of inventive power, are, in Dr. Brown's opinion, of easier explanation than has been hitherto imagined, and are all to be attributed to the original tendency of the mind to the suggestions of *analogy or resemblance* in preference to those of mere *proximity*. Thus the Conception of a single object suggests to a mind imbued with this fortunate tendency, a series of remote and refined analogies—summons up in profusion a train of images, at once beautiful and appropriate—and imparts a richness of thought, and vigour of diction, of which a humbler intellect is incapable.

The relation of Proximity is all that the latter recognises—and when any subject is presented, it recalls only the thoughts and opinions of others which have *co-existed* with the former conception of the same subject—thus chaining down the unhappy individual to helpless reminiscence and imitation, and presenting, under the borrowed colours of the Imagination, only the humbler toils of Memory.

The same distinction prevails in the pursuits of science. The inventive intellect is conducted by the force of the suggestions of analogy to the discovery of relations in the laws of the material world which must for ever remain impenetrable to him who possesses a less elastic tendency of mind.—And when the author feels that his theory of *Genius*, founded upon a distinction in the laws of Suggestion, which he had just been endeavouring to annihilate, must involve him in apparent contradiction, he explains himself by remarking, that the suggestions of Analogy are, after all, but the more indirect suggestions of a Proximity belonging not indeed to the objects themselves, but to the *emotions* with which they are observed or conceived,—and that in this manner, the suggestions of Analogy which belong to genius, proceed not immediately from the actual contiguity of the perceptions or conceptions, but mediately by the proximity of the *common feelings* with which the objects have been contemplated. The theory thus assumes at last a happy coincidence with the common opinions on the subject, by ascribing the highest genius to him who has viewed nature with the most sustained and intense emotions, whether this genius be displayed in works of fancy, of which emotion is the essence,—or even in the discoveries and inventions of philosophy: Because the man who has taken the largest and fondest survey of nature will succeed best in explaining her laws; and as the secret of philosophical invention consists in that minute observation by which what is essential in the phenomena is distinguished from what is casual, it seems adequately explained, in the author's opinion, by a theory which ascribes it to the suggestion of analogies, since these analogies will be both more numerous and distinct, the more constant, simple, and unencumbered the perceptions of the related objects.

The greater vivacity of a train of Conceptions, suggested not by analogous antecedent conceptions, but by the actual *Perception* of some external object suggesting the kindred and harmonizing train—a phenomenon which Mr. Stewart has ascribed to the greater *permanence* of the Perception, but

which Dr. Brown imputes to the felt *reality* of the object perceived, and its deeper power in creating emotion—is stated by this author to be a law hitherto not sufficiently regarded by philosophers, although capable of explaining some of the most interesting appearances in the physiology of mind.—In the view of this subject, generally taken, it seems moreover to be implied, Dr. Brown remarks, that the conceptions succeed each other *in a train*, in the literal sense of that term,—that they advance and disappear in regular succession, and never co-exist; although the slightest reflection must satisfy every one, that such is not the order of nature—that one conception, after performing its office of suggesting the next in the train, does not vanish, but remains to mingle with its successors, and influence the complexion of the entire groupe—an important truth, of which the exercise of the reasoning powers, founded on the comparison of objects, and implying their co-existence as Conceptions—but still more, the complex workings of Imagination, afford convincing evidence.

Before this new theory of the author's, the entire array of intellectual powers, marshalled by the ingenuity of preceding philosophers, and recognized indeed in the language of common life, disappears; and Conception, Memory, Imagination, become all merged and confounded in the simplicity of the author's Suggesting principle. What, says Dr. Brown, is the alleged power of *Conception*, but the suggesting principle; "that prin-"ciple by which conceptions and certain other feelings arise." —"In what does the remembrance of any thing differ "from the mere conception of it? It differs in this respect "merely, that when we use the word memory, we speak of "a more complex feeling; not of a mere conception, but of a "mere conception *combined with a notion of time.*"—The error into which philosophers have fallen, by considering Memory as a generically distinct faculty of the mind, has in Dr. Brown's opinion proceeded from an imperfect analysis of the phenomena of *Reminiscence*, in which we appear to have the power of recalling past conceptions by an *act of the will.* But there is a manifest illusion in this, because we cannot *will* the remembrance of conceptions without implying that the conceptions are already present to the mind, so as to become the subject of volition,—while in the phenomena referred to, all that truly distinguishes them, from the ordinary sequences of Conception, is the presence of "a vague Desire," which by rendering more permanent each part of the train of thought as it arises, assists powerfully in the evolution of the remainder of the sequence.

The power of Imagination, again, of which novelty of combination is the distinctive attribute, cannot, any more than Reminiscence, exemplify the exercise of *volition*; but the new combinations which fancy creates, and which were never before present to our consciousness, are the result of those suggestions of Analogy in the number and variety of which the power of Genius is by Dr. Brown supposed to reside.—"We think," says he in explanation, "of the form of a horse in rapid mo-"tion; its rapid motion suggests to us the analogous rapid mo-"tion of other animals; we think of the wings of a bird, not "losing, however, on that account the primary conception of the "form of a swift and beautiful horse, which suggested the swifter "organs of flight of the winged animal: the form of a horse, "and the wings of a bird, are thus mingled in one complex "state of mind. We have the conception of Pegasus."—In explaining "the continuous plans of invention" which are carried on by persons of genius, the author reiterates in substance his observations on the phenomenon of Reminiscence, and ascribes the sustained operations of fancy, not to any power of *volition*, which he thinks necessarily excluded by the mere statement of the case, but to the influence of *Desire* imparting intense interest and greater permanence to the intellectual presentiment of the subject,—retaining the conceptions which are suited to illustrate or embellish it as they arise,—and permitting those of a contrary description to fade away and disappear from the train of thought. "The phenomena of imagination, in short, are proofs," observes the author, "of those general tendencies of the mind by "which we are susceptible of simple suggestion, of relative sug-"gestion, and of desire, but not of any specific faculty additional "to these."

Nor are the phenomena of *Habit* of more difficult explanation, either as their supposed power confers additional dexterity in the acts performed, or more intense desire for their repetition. The dexterity acquired results from the economy of muscular power, which experience enables us to exercise, by teaching us the precise portion required for the purpose we have in view; while the increased desire for gratifications, perhaps indifferent in the beginning, proceeds from the frequent co-existence of the perceptions of the objects desired, with other feelings of delight, by which the objects and feelings reciprocally recal each other on the mere principle of Suggestion.

Thus Conception, Memory, Imagination, Habit, resolving themselves easily into the phenomena of Suggestion, are expunged from the catalogue of intellectual powers; the author,

however, admitting, that as the terms denote *complex states* of mind, of great interest and importance, it is from theory alone the terms are to be expelled, while they must still retain their place in the practice of language.

So much for the doctrine of Simple Suggestion. The "Relative Suggestions," or "*Feelings of relation*," which constitute the only other intellectual state of which the mind is susceptible, are either "relations of co-existence," or "relations of succession," as they embrace either "the *composition* of bodies or the *sequences* of objects and events."

The relation of Resemblance, of which Dr. Brown asserts that "the *suggestion or instant sequence* after the joint perception of the resembling objects seems as little mysterious as the mere Perception of the objects after the necessary previous organic change, or as any other sequence of feelings whatever" plunges him into the controversy so long maintained upon the doctrine of Classification. The *Nominalists*, he says, who felt no difficulty in recognizing the resemblance of a portrait to the person represented, would not acknowledge any *felt* resemblance of a square, an oblong, a rhombus, and a rhomboid, but maintained that the classification of the whole, as four-sided figures, is arbitrary and capricious. "The essence of this theory of generalization," says Dr. Brown, "is that we have no general notions or general feelings of any kind which lead us to class certain objects with certain other objects; that there is nothing general but the mere names or other symbols which we employ; and that in all the ascending gradations therefore of species, genus, order, and class, the arrangement is constituted as truly as it is defined by the mere word that expresses it, without any relative feeling of the mind as to any common circumstances of resemblance intermediate between the primary perception of the separate objects, and the verbal designation that ranks them together."

This theory, which strips general terms of all propriety of application—which renders the use of them capricious, by dissolving their connection with the intellectual *feelings* in which they have their origin—which reduces the process of arrangement and generalization to a mere play upon words, and essentially degrades the dignity of science itself, is repugnant, the author thinks, to reason, and absurd in its very statement. The *feeling* of agreement in certain qualities which accompanies the perception of resembling objects, is the cause of the invention of the general terms by which that agreement is expressed. "In short," says Dr. Brown, "there never would

have been general terms, if there had not been any thing general but terms."

The process by which generalization is accomplished, is obvious, he adds, in all its steps. We perceive two objects—the simple perception is the first step in the process; we *feel* their resemblance—this is the second step, and that of which the Nominalist takes no account; we invent and apply the general *term* expressive of this *feeling*, and this is the third and last step which has made such a figure in the system of the Nominalists, as to have obliterated the intermediate mental *state* upon which the validity of the whole series depends, and with which the intellectual process in fact terminates.

The general terms, however, although not essential to the intellectual process, serve the highly important use of communication —enable us to impart to other minds the result of the most subtle processes of thought equally with our conceptions of individual objects—give precision to science, and embody the successive accumulations of knowledge from age to age, in a form that is imperishable but with the destruction of language. That the intellectual process, however, is independent of the use of general terms, must be apparent, says the writer, from the phenomena presented by the deaf and dumb, who, by exhibiting the indications of their own solitary and scanty processes of this nature, shew at once their practicability, without the intervention of words, and the narrow limits by which, without such aid, they are bounded.

The *Internal Feeling of Resemblance*, therefore, is the cause, both of the invention and of the limitation of general terms; for it is no more possible, on the principles of the Nominalists, to assign a reason why any individual should be excluded from the classes which general terms denote, than why any other should be included.—The most celebrated writers among the Nominalists have thus been perpetually embarrassed by the contradictions of their own system, and in their reasonings have assumed the existence of "Classes" and "Orders," of which their doctrine denied the perception to be possible; they have talked of assigning to objects their proper classes in the course of the very argument by which they denied the power of the mind to comprehend what the word "class" means.—The source both of their errors, and of the favour with which they were received, may, in Dr. Brown's opinion, be traced to the absurdities of the theory of "Realism" with which they had in the first instance to contend, and which supposed that there were present to the mind in the process of generalization, certain "*universal forms or species*," of which the hypothesis was at once revolting to belief,

and unpropitious to science. It may be traced also, he thinks, to the absurdity of the system of "Conceptualism," by which the Nominalists were afterwards opposed, and which, by assuming that "Conceptions," instead of "*Feelings of relation*," were the prototypes in the mind, of general terms, embarrassed the whole doctrine, and covered with ridicule some of the most noted attempts at its exemplification.—Dr. Brown, therefore, believing that he had discovered the true source of all generalization, refuses equally to be called Realist, Nominalist, or Conceptualist; but, with the boldness of a discoverer in science, has invented a new term, and styled himself a "Relationist."

We have now given a summary of all that seems new or important in the system of Dr. Brown, and shall proceed to the calm and impartial investigation of the merits of his theory.

We feel compelled to pause on the very threshold of this system. Dr. Brown's rejection of the established divisions of the *powers* or *faculties* of the mind, rests manifestly upon the conclusions which he has adopted relative to the notion of *power* and *causation*; and whatever opinion may be entertained as to the validity of the *special* objections which he makes to the arrangements of his predecessors, it is obvious that his leading principle has a reference more extensive and profound than to their imputed imperfections. It is not wonderful that Powers or Faculties should be denied to the mind by the philosopher who excludes the notion of *power, with its ordinary attributes,* from the catalogue of intellectual realities, and who informs us that "we invent the term not to express any thing distinct and separable from the antecedent "itself, *but to express the simple relation which we feel of its "uniform immediate antecedence to a certain change.*"

The mental phenomena, therefore, in which preceding philosophers had recognized the existence and the operation of *powers* to which, with more or less felicity, they had severally assigned appropriate names, could present to the mind of an enquirer holding the opinions entertained by Dr. Brown on the nature of power and causation, only *a sequence of changes* in the *state* of the mind itself, indicating the series of impressions received from without, or the movements mysteriously progressive within—but uniformly negative of all innate and independent energy, of which, although the language may be retained for the purposes of discussion, yet the corresponding notion appears to be banished from his philosophical system.

Is it true, then, that by *cause and effect* we mean merely, as

we are told by Dr. Brown, "the invariable antecedent and consequent of the same phenomena in the same circumstances," and that we invent the term *power*, not to express any thing distinct from the antecedent itself, *but to express the simple relation which we feel of its uniform immediate antecedence to a certain change?* The case, we apprehend, is very different.

When we observe a change produced in any part of the material world, we have an intuitive and indestructible belief that such change must have proceeded from *some cause*, without the operation of which the change could not have been effected. This belief is universal, intuitive, insurmountable, and is no more to be questioned by scepticism than it is to be established by reasoning. *Can* a change in matter or in mind take place without a *cause*, either perceptible to our observation, or assumed to exist, although eluding our researches? The mere statement of such a proposition would involve a contradiction—and the general and invincible belief, that, for every effect, or for every change, there must be a preceding cause, is as much a part of our nature—as much an immutable law of our thoughts, as that qualities must inhere in a *substance*, although we shall ever remain profoundly ignorant of that which we call *substance*, considered as an object of sensation. The Senses do not indeed inform us of Causation in the intellectual sense of the term, as implying *power* to produce the change, and the actual *operation* of that power; but we *have* notions which are *not* derived from the senses—which are elementary laws of thought—and which it is vain to endeavour to trace to the ordinary inlets by which we acquire a knowledge of the qualities of external nature.

It is to the false assumption that *all* our notions are derived, mediately or immediately, from sensation, and that whatever cannot, by a refined analysis, be ultimately referred to this copious source, must be discarded as unreal from our systems of philosophy, that all the mystery in which this question has been wrapped, is to be ascribed. In the impulse, with which, to use Mr. Hume's illustration, one billiard-ball is directed upon another, and the consequent movement of the ball which was formerly at rest—the *senses* inform us only of the change which has taken place, and of the antecedence of the impulse; but in all this there is no intimation of power or necessary connection; and this philosopher therefore concluded, that because he could not detect in the external phenomena of sensation, the internal and independent laws of thought, the latter had but an imaginary, not a real existence. He forgot that our knowledge

of the existence of Matter itself is founded on the same mysterious but incontrovertible law, of which he was here unphilosophically demanding the proof; and that as our Consciousness indicates to us only a series of Sensations which belong to our own minds, and which announce the existence of their external causes, upon the principle alone that every change in matter or in mind *must have a cause*—so to dispute the general principle is to demand the proof of that which lies at the foundation of all knowledge. He felt himself compelled, therefore, to ascribe to *habit* that anticipation of similar results which habit alone could never have generated, and which owes its origin to an ultimate law of thought, of which it is vain to dispute the simplicity, and impossible to question the intimations.

In the phenomena of causation indeed, the intimations of sense present to us only what Dr. Brown calls a series of invariable antecedents and consequents—but we *have* notions which are above and beyond this casual combination, and which assure us with certainty, that the changes which we observe could not happen without causation—implying by this term not merely a casual series of antecedents and consequents, but efficient and operating energy. It is on this principle we judge of the phenomena both of the material and the intellectual world, and whenever we observe a change regularly produced upon the antecedence of a certain object or objects, we infer that the secret *power* of which the intellect presumes the preliminary exercise before the change can occur, resides in the objects or phenomena which thus uniformly precede the event. This inference may or may not be correct, *as to the particular material form* in which the energy is embodied—we may confound mere succession with causation—we may blend together, in the various combinations which the senses present, that efficacy which is requisite for the result produced, with the casual and fortuitous appendages which have been connected with it: And it is the chief aim of philosophy, working by experiment, to enable us to make the necessary separation, and to distinguish what is occasional from what is constant in the combination. Such is the legitimate scope of all inquiries merely physical, which are destined to collect the laws of nature from the accurate observation of the phenomena by which they are promulgated, and to mark them with the fidelity which belongs to the office of a reporter. The metaphysician, however, does his duty but imperfectly by explaining what may be denominated the *physiology* of his subject—by recording the changes superinduced upon it by the influence of external agents, or the

succession of its own inward movements—by considering it as *passive* and inert—and exhibiting in his speculations a servile analogy to the researches of the natural philosopher. *He* must not only observe the phenomena which it presents, and which appear the immediate result of the external impulses to which it is subjected, but ponder the laws of its being, as they modify its every feeling and thought—laws of which sense only developes the operation, without having created the original tendency—and of which the agency is not less manifest throughout the whole train of thought, than the origin lies concealed in the simplicity of first principles, and enveloped in the deepest recesses of our nature.

The fundamental laws of thought, therefore, compel us to ascribe every change which is produced, to a latent energy of which it is the province of Intellect alone to descry the mysterious existence—The senses exhibit to us some material form in circumstances which correspond with our intellectual notion of the agency of that *power* of which sensation alone can give no intimation—and we readily, and for practical purposes, securely acquiesce in the inference, that the material form is the seat of the immaterial energy in the same manner as we habitually conceive that superficial expansion is measured by the eye, till a more profound analysis convince us that this organ is inadequate to the functions assigned to it. But we soon conquer this illusion, and piercing the internal sources of thought, and governed by the principle which is coeval with our spirits, and wrought into their very nature, viz. that without operating energy, there can be no change produced or effect realized—and perceiving from our juster conceptions of Matter, that in secondary causes this invisible energy cannot reside in an independent state, or operate except as through a medium—we conclude that the phenomena of causation exhibit to the mind something more than sensation imparts—and rising above the material phenomena in which the latent energy was, by a rash inference, supposed to be independently embodied, ascend to a higher source, of which the superintending power is not more demanded by the hopes and feelings of mankind, than the operating energy is diffused throughout the phenomena of the universe.

If the notion of *power*, such as it suggests itself to every mind, be not deducible from the phenomena of Matter, it cannot, according to Dr. Brown's system, be derived from the consciousness of *mental energy*—because his system, by discarding all *powers* or *faculties* of the mind, and substituting for them a series of successive *states*, robs the intellect itself of all energy, and disqualifies it of

course for suggesting any notion of *power*. Whence then has the notion of *power* been derived, such as it exists in every mind, and is expressed in every language of the earth? That more is expressed by the term than "uniform immediate antecedence," is manifest from this circumstance alone—that it required the interposition of a philosopher of the last century to correct the mistake which had been committed by countless generations of human beings, and to restrict the sense of the term in such a manner as to exclude elements which preceding philosophers, equally with the vulgar, had deemed essential to one of the simplest and most universal of all our notions. Whence, then, this fundamental and all-prevailing error which had perverted language, and corrupted the stream of thought for ages—an error not in some remote subject of speculation which experience alone could illustrate and induction mature—but in the interpretation even of the primary laws of thought?—The axioms of science—the permanent and indissoluble relations of thought are above and beyond all scepticism—and no philosopher will be safe in attempting either to verify or to question their truth by argument. The notion of *cause* and *effect* is derived immediately from the constitution of the mind; and it is absurd to endeavour to detect in the indications of sense what sense never can develope—and to expect in its phenomena the visible presence of that *power* of which the intellect alone is the conscious and privileged percipient.

Dr. Brown himself, in examining the doctrine of Nominalism, employs an argument which, if it had suggested itself to his mind when treating of Causation, might have shewn him the error of his theory. The Nominalist, he says, who asserts that nothing is general but *words*, cannot, upon his own principles, account for the origin and application of these words, which, if there be nothing in nature by which their sense is determined, might, with propriety, admit of any combinations, however fantastic. "According to him," (the Nominalist,) says Dr. Brown, "there is nothing general but the mere names themselves, "which are used to connect objects together by a tie that is purely verbal, and why these are used to connect by that verbal tie "any one set of objects rather than any other set of objects, he "cannot assign any reason whatever, since the assignment of a "reason *would be the acknowledgment of some previous intervening feeling of the mind as general as the objects which it marked out to be distinguished by the general word; and therefore, as general as the word that only indicated an internal distinction previously made.*"

The principle assumed here—and it is a sound one—is, that words *must* express something to which there exists what Dr. Brown denominates a corresponding "feeling in the "mind," and that it is impossible, without absurdity, to deny the existence of this *feeling*, and, at the same time, to support the propriety of the application of the terms. Let us apply this principle to the terms *cause* and *effect*, *power*, and *energy*, which have all been in familiar use, and of which it is impossible to dispute that the ordinary sense indicates something more than "uniform immediate antecedence," without denying to Mr. Hume and his followers the merit of a discovery of which they would not willingly be defrauded. But all that is additional in the sense of these terms, is, if Dr. Brown's theory be just, a mere illusion, to which, as there exists no prototype in the *feelings* of the mind, so there could be no propriety in the application of the terms to those peculiar relations or combinations to which they have been immemorially devoted in the thoughts, and by the language of mankind.

Nor by this misplaced scepticism of Mr. Hume and his followers, as to our notion of Power, do they emancipate themselves from the bondage of those *intuitive* principles of thought which they are so prompt to analyse; for they feel themselves compelled, in supplement of the vacuum created by expelling our primary notions of Causation, to resort to other primary notions yet more complex and mysterious—to admit, in the language of the author before us, "a principle by which "it is impossible for us not to believe that the course of "nature has been uniform, and will be uniform, in all the "simple sequences that have composed, or may hereafter "compose it; and that the same antecedents, therefore, have al-"ways been followed, and will continue to be followed, by the "same consequents;" and this they describe as "the great law "which regulates alike our practical expectations and our sys-"tems of philosophy—a principle of our nature, intuitive or in-"dependent of all reasoning, since reasoning, when it is extended "from the moment of actual observation to the unobserved past "or the unobserved future, must itself be founded on it." And this awkward substitution of a first principle, apparently complicated, and visibly springing from the source of *experience*, not from the original laws of thought, they feel themselves compelled to make in consequence of their hasty rejection of a principle far simpler and more obvious; viz. that every change, or effect, which we contemplate, proceeds from a cause—from a *power* adequate to produce it—from operating energy, whether that

energy reside in the physical forms which we remark as the immediate antecedents of the change, or be transmitted through them only as a medium of communication; without perceiving that the principle assumed by them as intuitive, is but a result of that which they reject—and that it is from a belief founded upon experience that the same external forms which are instrumental in the process of causation, embody the same inward and operating energy, that we expect, in like circumstances, a similar result, and anticipate the uniformity of the visible phenomena of nature from the constancy of the impalpable and mysterious spirit of power with which they are impregnated.

We *have*, therefore, a notion of power different from that of *uniform immediate antecedence*, into which Dr. Brown resolves it; and if there be any phenomena by which this notion must have been primarily, and has ever been pre-eminently elicited, *they are the phenomena of mind.* Dr. Brown denies the existence of Consciousness, as a separate *power* or even *state* of the mind; but although he may reject the *term*, and censure the arrangement by which it has been introduced, he does not, of course, deny the existence of that *knowledge* of the states or powers of the mind, of which the intimations have been generally referred to the exploded faculty. The knowledge imparted by Consciousness is not indeed, in his opinion, derived from a particular faculty, but is included in the Sensations or Conceptions of which we are said to be conscious. We *know*, however, in some form or other, the states or operations of our own minds; and this knowledge which we possess, imparts, pre-eminently and conspicuously the notion of power. That the mind appears altogether passive and inert—that it exhibits only a series of *states*—a sequence of changes of which it is the *subject* only, without developing, in any form, the elements of energy, and imparting the notion of power; that it is the first duty of a philosopher to banish, from his vocabulary, every term which can give countenance to this notion, and to sweep away the distinctions which have alike incorporated themselves with the language of the vulgar, and the systems of philosophers—may, in the result, appear to be a profound truth; but surely wears, in its first statement, the aspect of a revolting paradox. Yet this paradox forms the leading novelty in the system of Dr. Brown.

"From the beginning of life," says this author, "to its close, "the mind has existed, and is known to us only as thus existing "*in various states of changeful feeling:* the feeling at each mo- "ment being its state at each moment, that continued till the "new state of some other feeling was more or less rapidly in-

"duced. The whole series of these feelings, therefore, has "been the whole series of its states," &c. In another place, he observes, "There is a physiology of the mind then as there is a "physiology of the body—a science which examines the pheno- "mena of our spiritual part simply as phenomena, and from the "order of their succession, or other circumstances of analogy, ar- "ranges them in classes under certain general names: as in the "physiology of our corporeal part we consider the phenomena "of a different kind which the body exhibits, and reduce all the "diversities of these under the names of a few general func- "tions."

Not to mention the novel and not very felicitous application of the term "Feeling" which occurs in the above passages, and which pervades indeed the whole of Dr. Brown's book, there are other errors which, as we apprehend, pierce yet deeper into his system of philosophy. The science of mind must ever be, in a great measure, a work of arrangement and Classification—for the phenomena about which it is conversant have been present to the Consciousness of mankind in all ages, and familiar to the secrecy of every human breast. Whatever doctrine therefore affects the principle of Classification, assumes an importance in this science which could belong to it in no other, and becomes the key-stone of the entire superstructure which is to be reared. The view taken of the mind as active or passive—as operating by internal energies, or merely enduring impressions from without—as developing *powers* and *faculties*, or exhibiting only a sequence of *states or feelings*—becomes therefore of the first importance, because it tinges in no slight degree the whole course of future speculation, and decides whether the system is to be one of the Philosophy, or only of the *physiology* of the mind.

The term "Physiology," of which Dr. Brown seems so fond, and by which he has designated his work, appears to us to be unhappily chosen, because it gives an imperfect view of the legitimate objects of the science. The mind *may*, no doubt, be examined after the manner proposed by Dr. Brown, as presenting merely a series of *states* connected together reciprocally as antecedents and consequents, without the intervention of intellectual *power* or *energy* to break in upon the inert and passive series: but it will not, we think, be wisely or philosophically examined after this manner, because there *is* something more involved, if not conspicuously developed, in the phenomena of mind than this simple sequence, and because there *is* intellectual power or energy of which this system not only takes no account but implies

the non-existence. It is impossible, of course, to speculate upon the phenomena at all without forming a theory which shall either include or reject the existence of this mental energy, and thereby decide the entire system of arrangement and the fabric of nomenclature, which is of the very essence of this science, and has in all ages formed the chief subject of its controversies and enquiries.

Keeping these general observations in view upon the leading principle of the philosophy of Dr. Brown, we shall proceed to examine a little more in detail the various novelties in point of doctrine which distinguish the work before us.

Dr. Brown denies that "Consciousness" forms a separate Power or *State* of mind. Now, Consciousness has been denominated not unaptly "internal Perception,"—that power by which we know that we have certain mental impressions, *as distinguished from others.* "I am conscious of a particular "feeling," says Dr. Brown, "means only, I feel in a *parti-* "*cular* manner"—implying, of course, that the mind distinguishes betwixt *that* and *other* manners, and thus including something more than the mere *feeling* or *impression.* There is an internal *perception*, therefore, *having a state of mind for its object*—and if Memory be essential to this comparison of successive states, *that* is a reason only for asserting Consciousness to be a complex power, not for denying it to be a power at all. To be conscious of a Sensation as produced from *without*, is something different from simple *feeling*; a combination occurs here of different elements, of which the internal Perception is not the least important.

Dr. Brown has wisely followed his predecessors in treating of the notion of Personal Identity—a notion which we must be contented to consider as an ultimate fact in our mental constitution. But when he states the difficulty of supposing the mind to retain its identity, after its constant and rapid changes of thought and feeling—he forgets, that although the *substance* of mind, like that of matter, is known to us only by its qualities, yet the Conception of these qualities does not comprehend all that is included in our notion of either—that by a primary law of our thoughts, we refer these qualities to a *substance* which we conceive to remain unaltered, even under the most various modifications of the qualities—that the *Feelings* or qualities of mind may therefore be changed, while the essence remains the same—and that no difficulty could occur on this subject, except by disputing those primary laws of thought of which we can give

no account, but upon which all science is grounded, and by which we are irresistibly governed.

Upon the question as to the origin of our knowledge of the existence of Matter, we must make two general remarks before proceeding to examine the theory of Dr. Brown. 1*st*, That by affirming the sense of Touch to be the medium by which we learn the existence of matter, philosophers have not asserted, that the sensations which this organ supplies, constitute the *whole* of our knowledge of matter, or are not mingled with intellectual inferences. The Sense is merely the inlet of the Sensations, but does not generate the *notions* which we have of matter. 2*d*, That what Dr. Brown denominates *muscular feelings*, being *states of mind* alone, could never form the medium of that communication betwixt mind and matter, by which the existence of the latter is recognised, however deeply such feelings may mingle in the complex notion—and that as it is only through the sense of Touch itself, that the alleged muscular feelings can be produced, it is absurd to assign *these* feelings as the origin of the compound notion.

There is an important difference betwixt our belief of the existence generally of *something external*, and our knowledge *of its specific properties*. Dr. Brown himself resolves our knowledge of Figure and Dimension into the *felt resistance* made to a series of muscular contractions, which had formerly been experienced without resistance—and which, as we cannot ascribe the change to any thing in the mind itself, we necessarily refer to something external. A change in the mental state, without any cause in the mind itself, of which we are conscious, necessarily generates the notion of something external, of which the properties are afterwards perceived in detail. As every Sensation therefore, produces a change in the mind not generated by the mind itself, any or all of our senses may give us the notion of an external cause.

But what is this external cause, and how do we acquire the notion of its Resistance, Magnitude, and Figure? Through the medium of the sense of Touch—these qualities not being the proper objects of the other senses. But the compound notion is not entirely tactual—*it only originates in touch*, which is all that ever was meant by philosophers. Could we have muscular feelings, as Dr. Brown calls them, without the sense of Touch? No more than we could have intellectual *feelings*, without possessing any external senses whatever. It is through the sense of touch that the muscular feelings, which, in truth, are nothing but Per-

ceptions of resistance, are generated. It is through the sense of Touch that the mind communicates with the external world —that it receives that intimation of interrupted muscular contraction, by which the notion of Resistance is produced—and that it becomes enabled to apply to external objects the notion of *time*, as derived from the succession of its own Feelings, and to give to the commensurate quality in matter itself the name of Dimension, in the manner so ingeniously, and, as we think, so justly explained by Dr. Brown. The error of this author lies in supposing that *any* of the senses may not give us the general notion of an external cause—and that the *feelings* and inferences of the mind, which combine with our notion of resistance and dimension as they unite in every other complex perception, preclude us from ascribing to Touch, as the peculiar organ of such communication, the origin, so far as it is *sensible* at all, of these complex notions.

Hence we perceive the justice of the distinction made by Dr. Reid, betwixt mere Sensation and Perception. There *is* Sensation and there *is* Perception; the latter implying, as Dr. Reid observes, an act of Judgment, by which we refer the sensation directly to something external, and distinguish it from the Conceptions which are formed by the mind, without the intervention of an external cause. Dr. Brown admits, that in the case of Touch, there does occur the phenomenon to which Dr. Reid applies the term Perception—but he disputes about the name, and asks why this particular mental phenomenon should be distinguished as a separate Power or State more than our other intuitions?—The reason is obvious: our belief of personal identity, for example, is a primary law of thought, of which no explanation can be given. Our Perception of external objects, involves an act of Judgment, a mental inference, which Dr. Brown has himself been compelled to admit, when he traces the origin of our notion of Dimension to the *feeling* that the usual muscular contractions have been interrupted, without any mental cause of which we are conscious—and the *inference* that the cause must therefore be *external*. Perception, therefore, being that peculiar act of Judgment by which we necessarily infer the existence of an external world, has not improperly been considered a separate power

It is an error of Dr. Brown to suppose that the office of Perception is confined to the indications of the sense of touch—for all the senses equally occasion mental changes,—or an interruption of sequences; while "all of which we were conscious in our-

selves at the moment preceding the interruption, was exactly the same as in the many former instances, when the regular sequence took place;" the circumstance by which alone, as Dr. Brown confesses, we are led to "ascribe the feeling to something that is "foreign to us."—Into the complex perceptions by which the actual intimations of one sense suggest the past intimations of other senses, and present to the mind the notion of the entire compound which we denominate "Matter," with all the variety of its qualities, the suggestions of memory may, as Dr. Brown observes, enter; but this is no reason for refusing to Perception a separate and distinct name—the more especially as the leading element is the *judgment* or *inference* drawn, in which the essence of this mental power consists, and from which we derive immediately our knowledge of the existence of the material world.

Without pronouncing, therefore, any opinion on the general merits of the system of Dr. Reid, we think that in this point he has not been successfully assailed by the author before us.—It is by the mental act of Perception that we know the existence of an external world, upon the principle, that every mental change *must* have a cause, and that when this cause does not exist in the mind itself, it must be traced to something without. But if there were something present to the mind, and distinct from Matter—if there were "ideas," in the now exploded sense of that term, to account for the mental changes without *necessarily* implying the existence of matter—then would the invincible, because necessary argument for its existence be lost, and the sophisms of Berkeley would become triumphant. If we admit the existence of ideas, then, although we must practically believe the existence of matter, our belief may still be a delusion; but destroy this metaphysical fiction, and our belief of the existence of matter cannot be questioned, without disputing the primary laws of thought,—without asserting that there may be a mental change or effect without a cause—an effect, of which the cause neither exists in the mind itself, nor in any thing external.

Dr. Brown has been successful, we think, in subverting Berkeley's distinction betwixt Visible and Tangible magnitude, and in shewing that the former, as an object of Perception, is a nonentity. He has not been so fortunate in his analysis of that process of mind to which the word "Attention" has been hitherto applied, and in which the "Will" has been supposed to be conspicuously operative. All that Dr. Brown truly does, is to substitute for the term "Will," that of "Desire." We cannot directly "will," he says, the permanence of our sensations or per-

ceptions; but in the complex state in which they are generally presented to the mind, we may "desire to be impressed with "some parts of the complex perception in a more vivid manner than with others"—a desire which immediately realizes its object, and renders the perception more vivid accordingly.—To us, we confess this discussion appears to border on quibbling; for we cannot easily distinguish betwixt that "desire" to render some part of thought more vivid, which is immediately followed with the effect desired, from "will," of which Dr. Brown's own definition is, in substance, that it is Desire, followed by the consequence which had been anticipated.

If we substitute for the word "idea," which is now generally understood to be synonymous with Conception, the term "*feeling*," by which Dr. Brown has chosen, with no great felicity in the selection, to designate all our intellectual states—Sensations, Conceptions, Emotions, Relations—we shall have, in the "association of feelings," the same comprehensive explanation of all the intellectual phenomena which we receive from Dr. Brown's System of "suggestions," with this difference, that the term "association," is rather more exclusive than the phrase "suggestion," of that *active power* of which he is desirous to exclude the notion from the physiology of mind. The discoveries of Dr. Brown, therefore, are little more than the principles of Hartley somewhat expanded, and much disguised, by the graces of a new nomenclature.

That there is no real novelty here—that the property of Sequence, Connection, Association, or by whatever name the mysterious tie may be designated, which binds our thoughts or mental *feelings* together, has not only been observed by the philosophers of all ages, but has occupied a conspicuous place in their speculations, is attested by the attempt of Aristotle to enumerate the general laws of association—an attempt which has been reiterated with various success, from the days of the Greek philosopher, down to the age of Mr. Hume. They all knew and observed the law well, of which the Perception indeed is involved in the most familiar actions of every human being; but they did not conceive that it afforded a basis sufficiently stable for the structure of intellectual philosophy. They considered the laws of association as regulating the order only, in which the various powers of intellect are put forth, not as superseding the operation or the recognition of these *powers*; and while they observed that one conception arose upon the antecedence of another, they held *that* antecedence to be the *occa-*

sion, not the *cause*, of the succeeding Conception, considering the succession as a change or *effect*, which must have an operating cause adequate to produce it—a cause which, in operations purely intellectual, they could not refer to matter, and therefore justly ascribed to the mind itself.

But although there be no *novelty* in the principle of the theory, will any *advantage* be derived from adopting it? Will it prove a benefit to science, that instead of the *principle* of classification hitherto adopted by philosophers, which ascribes *powers* or *faculties* to the mind, and classes them according to the various aspects which they assume, the whole phenomena should be considered in the light of *a series of sequences*, and the established distinctions of language be at least theoretically abolished? One perception or conception is the antecedent of another; it "suggests" it, says Dr. Brown, and therefore for the existence of the suggested perception, we are to account solely, by referring to the principle of suggestion. We are not to admit that any mental *power* has been exercised in creating the suggested conception; and why? Because we do not perceive the existence or operation of any such power. But is *power* an object of direct perception?—The suggested conception is evidently created by *power* of some kind, whether this power be a faculty of the intellect itself, or be inherent in the antecedent Perception or Conception. That the power truly belongs to the mind itself, not to the antecedent conception or perception, cannot be consistently disputed by Dr. Brown, who maintains the antecedent conception itself to be only a state of mind *or the mind itself existing in a certain state*; and by denying to the mind Powers or Faculties, he appears just to assert this contradiction, that it makes continual and rapid transitions from one state to another, without the *power* of making such transitions.

But even if we should include under his term "suggestion," the notion of power, the question arises,—whether all the phenomena of mind can be conveniently resolved into this single exhibition of power, and whether every other distinction except of "external and internal affections," and "simple and relative suggestion," could be even in theory abolished with advantage?

It will be observed, that there is no novelty in his development *of the laws of suggestion*, which are in truth just the laws of association, propounded by his predecessors. The *facts*, too, by the aid of which he endeavours to resolve all the powers of the mind into "simple suggestion," had been remarked before,

and included in every philosophical account of these powers. The simple question therefore is, whether there be not *distinctive marks* in Conception, Memory, Imagination, Habit, &c. be they powers or *states* of mind, sufficient to entitle them to be separated in the classification of the phenomena; whether it be not the better arrangement, to assume their acknowledged *differences* as the ground of classification, instead of selecting the points, in which in common with all the phenomena of mind they agree, thereby amalgamating together, what for the sake of lucid arrangement, and agreeably to the analogies of language, ought to be viewed as distinct?

Dr. Brown distinguishes, indeed, betwixt the *external* and *internal* affections of the mind, meaning by the former, Sensations only, and by the latter, all that is strictly intellectual, and not immediately dependent on matter. But why does he distinguish so far as he has done; or, having done so, upon what principle does he reject the more numerous distinctions of his predecessors? "Conception," says he, "is the re-"sult of the suggesting principle—of that principle by which "the mind has a tendency, after existing in one certain state, to "exist in another as its sequence." But what is Sensation itself, except the result of a tendency to exist in a certain state upon the exhibition of the external agent, which is the cause of the sensation? And if it be maintained as a distinction, that in the one case the antecedence is *internal*, in the other *external*, we ask upon what principle is this ground of distinction recognised, while others no less palpable are rejected?

"Memory," says Dr. Brown, "is conception, *combined with it* "*notion of time*;" yet it is not in theory to be distinguished from *conception*, although the above most important addition be involved in the complex state—a difference that has been held sufficient by philosophers, and by the vulgar of all ages, to justify an important distinction. What is the discovery made by Dr. Brown in this instance? Has it not been uniformly stated, or manifestly assumed in the writings of every philosopher, that the remembrance of an object of sight includes the *conception* of that object?—It is difficult to perceive why that system which distinguishes physical from intellectual antecedence, should reject the no less palpable distinction betwixt the past and the present; why he who distinguishes Sensation from Conception, should not also distinguish Conception from Memory; or, why he should not distinguish both from Imagination, the workings of which surely possess a character which entitles them to a dis-

tinctive name from him who discriminates Simple Suggestions from the intimations of Sense, and from the Perception of relations—all of which are equally *states* or *powers* of mind, and might, in the pursuit of excessive simplification, be resolved into that property in which they all agree, without noticing the no less important properties in which they differ, and which form the only legitimate basis of classification.

It is not, therefore, because Dr. Brown has informed us that Conception is an important element in the more complex processes of Memory, Imagination, and Habit, which had been done long before, that we dissent from his system, but because he takes to himself the merit of *discovery* where there is none; and, because having seized one of the leading elements of these complex processes, in which they all agree, without disputing the presence of other elements, or the production of other results by which the faculties are conspicuously distinguished,—he produces a very unphilosophical arrangement, by founding it upon the *common* quality or element when he should have sought the generic *difference* alone as the ground-work of classification. It is because the analysis of Memory, Imagination, Habit, &c. as conducted by him, has a tendency to produce confusion in this science, of which the most substantial virtue is lucid arrangement, and because the discoveries which he professes to have made, without aiding science in any way, would, if there were a corresponding change of phraseology, confound the common uses and the received proprieties of language.

Dr. Brown rejects the term Association, and adopts the word "suggestion," because, says he, "the former seems to imply some "mysterious process of union as necessary before the suggestion itself;" a remark from which we should be led to infer, that he is about to disprove altogether the existence of any such imaginary relation. But he proceeds immediately to expound and to confirm the very laws of connection, which Mr. Hume had developed in treating of the association of ideas. Does he mean that Resemblance, for example—which he admits, with some explanation, among the number of these laws—does *not* express a relation subsisting among the objects *antecedent* to their reciprocal suggestion?—He has left this branch of his subject where he found it, except that he has extended the influence of the laws of association to *feelings* of relation and to Emotions as well as Conceptions; an extension in which there is the less of real novelty, that by the author's own account the term "idea" as vaguely used by Mr. Hume and others, embraced *all*

our mental states, although it has since been more accurately limited, so as to denote our Conceptions alone.

Every one, besides, knew long before Dr. Brown wrote that Conception was included in Memory, and that Memory itself was included in the exercise of Imagination, because this latter faculty in its creations is only relatively, not absolutely new, and that although its combinations may be created, their elements are only remembered; And when the *secondary* laws of suggestion, laid down by Dr. Brown, were assumed as laws of Memory, they were virtually propounded also as laws of Imagination, and indeed of all the faculties into which Conception enters—in other words, of all the phenomena of Association or Suggestion; the only difference being, that this author has stated them, not separately as laws of the various intellectual powers, but generally as the laws of that *suggesting principle*, in the vagueness of which he has confounded them all.

Dr. Brown's theory of Genius is just the common metaphysical explanation of the phenomena, embellished by the novelty of the language employed. That persons of genius are distinguished by a vigorous imagination; by the profusion of the images which are suggested to their minds by subjects which waken no new train of thought in individuals less gifted, is matter of familiar and ordinary remark. That such images arise not disconnected, but in a train, is equally familiar to every one; and that the *sequence*, to use a favourite term of Dr. Brown's, is governed by the principle of *analogy*, has been observed by the most ordinary theorists, who have generally ascribed the phenomena of *wit* to the perception of resemblances. Every one had also remarked a susceptibility of intense feeling and emotion to be characteristic of genius, and had ascribed to this tendency the more acute and lively *perceptions*, which such persons form, and of which the influence could not be indifferent upon the Memory or Imagination. In short, it has long been known, that intense feeling and a rapid perception of resemblances are qualities characteristic of genius, and that the more fervid emotions accompanying its perceptions, bestow upon them a liveliness and a facility of being revived, of which perhaps the more minute history alone has been better developed by Dr. Brown than by his predecessors.

What then do we really learn from this part of Dr. Brown's theory? That Conception is the power merely of the Suggesting principle—that Memory is "mere conception combined with a notion of time"—that Imagination itself is only the tendency of

the suggesting principle to the relations of analogy—that conceptions arise agreeably to certain laws of association, and that all the powers or *states* of mind have something kindred in them —While we know, and Dr. Brown does not dispute it, that they have also something essentially different—that to Memory belongs *a notion of time*, and to Imagination *novelty* of combination—circumstances of sufficient distinction for the purposes of philosophcal classification? What do we gain by confounding the *law* which *suggests* the Conception—the Remembrance—the new Combination—with the *power* of mind which *produces* these results—of which we cannot cease to think, because we cannot imagine an effect to be produced without a power to produce it—and which we refer to the mind itself, because we do not perceive the operation of an external cause?

Nor does the author's explanation of the phenomena of *reminiscence*, so as to exclude the notion of *power*, strike us as either felicitous or conclusive. His object is to banish the operation of Will from the phenomena: "and how," says he, "can you *will* to recal a past event or conception," since, by the very hypothesis, the event must be already remembered, or the Conception formed before the will can embrace it—and that which is sought must be already acquired before the act supposed necessary for obtaining it is performed?—What account then does *he* give of the phenomena? It would have been too bold a paradox to assert that they do *not* present a state of mind into which some other element besides Simple Suggestion enters—and, therefore, Dr. Brown has introduced what he calls a "vague Desire," which operates not directly by recalling the event or conception sought, but indirectly by rendering more vivid and permanent the part of the connecting train or sequence which has already been realized. But there *is power* in the Desire itself, if it render more permanent any part of the train; and if by this means the event or conception sought to be remembered be actually called up, then we have *desire operating its intended effect*, which is precisely Dr. Brown's own definition of the term "Will."

Dr. Brown's argument on the subject of *general terms*, is complete and triumphant; and indeed the prevalence of so absurd a doctrine as that maintained by the celebrated sect of Nominalists, may well excite surprise.—The erroneous assumption of certain facts, as first principles, long perplexed metaphysicians in their explanation of the phenomena of mind, and reduced them to the choice either of abandoning the very

basis of their systems, or of concluding boldly against the common sense and reason of mankind; a choice which, unhappily for the dignity of the science, has seldom embarrassed a true metaphysical genius.

It was long a leading principle, that the elements of all our most complex combinations of thought must be sought *in sensation;* that whatever could not be traced to this source, and realized as a Conception or idea, had no mental existence; and that as the relations to which general terms correspond, and on which their signification depends, are neither Sensations nor Conceptions, so they could not be said to exist,—all that is common to a class of related objects, being the *term* by which that relation is expressed. In this manner, as Dr. Brown has remarked, general terms being deprived of all relation to thought, by which the meaning of other words is fixed and defined, must, if the theory of the Nominalists had been true, have been without sense or meaning. The exclusion of that *notion* of relation, about which all reasoning is conversant, from the theory which professed to assign the origin of the general terms by means of which reasoning is chiefly conducted, led, as it could not fail to do, to the most perplexing embarrassment.

Mr. Stewart has, we think, somewhere in his philosophical Essays, noticed and exposed this fundamental error, which, by gratuitously narrowing the basis of science, rendered the whole structure insecure. He has remarked, that we *have* notions of which sensation is not directly the *cause*, but only indirectly the *occasion*—notions which it is vain to attempt either to trace to sensation, or to seek to realize in the form of Conceptions, Ideas, Impressions, or whatever other term may be used to denote that state of mind of which Dr. Brown remarks, that "it appears to present something which we may "imagine at least to be embodied before us." Simple and obvious as this discovery may appear, it is of real importance in closing the many fruitless controversies by which this science has in all ages been distracted, and especially in terminating the endless arguments of the Nominalists, Realists, and Conceptualists. We *have* perceptions of relation not referable to sense, and never embodied as Conceptions—and the simple statement of the fact is all that is required, because we here touch an ultimate law, or principle of our nature, of which it is impossible to give any farther account.

General terms are the language by which these Perceptions or notions are expressed; and of which, therefore, it is absurd to

seek the prototype in Conceptions, impressions, or ideas. To adopt the doctrine of the Nominalists, and to assert that general terms are wholly insignificant, and uncontrolled by the power of corresponding thought, either in their expansion or limitation, is a palpable absurdity, scarcely less revolting than the system of the Realists themselves, who, as Dr. Brown remarks, "supposed "the objects of the understanding, in generalizing, to be certain "universal forms or species, distinct both from the mind and "from external things" The nearest approach to the truth was undoubtedly made by the Conceptualists, at the head of whom was Locke himself, who, by substituting the term "notion" for idea," would have rendered his doctrine accurate and just. Dr. Brown accordingly remarks, that "Locke, though with a very "little more refinement of analysis, he could scarcely have failed "to discover that his *general idea* was truly a *general feeling of* "*relation* only, had unfortunately made a different arrangement "of the feeling, and an arrangement which necessarily subjected "it to various misapprehensions." The source of his error lay in his exclusion of one entire class of Feelings, as Dr. Brown would call them, or Perceptions, as we should rather be disposed to name them, from the number of the primary phenomena; an error which, as already observed, Mr. Stewart had in effect corrected, and of which correction the author before us has, in this instance, made the legitimate application.

We have thus endeavoured to examine a system which the author believed to contain "many original views of the general "phenomena of the mind, and many new analyses of some of its "most perplexing phenomena," and have spoken, honestly and firmly, our opinion of it. The perplexity created by erroneous theories in this, above all the other sciences, has been so deeply felt, that the prompt exclusion of a system pretending to novelty, and founded in error, becomes perhaps a service of some importance to science.

The history of the philosophy of mind, presents indeed a very discouraging aspect to the enquirer. Few *discoveries* have been made which have not resolved themselves into mere verbal distinctions, and while the collection of facts has been scanty, and the accumulation of results slow, the science has been prolific only of controversy and disputation. The darkness which hangs over the intellectual processes has been pierced only to introduce the scintillations of verbal discussion, which have soon expired, leaving the scene again to close in primeval night. Theories advan-

ced with great pretensions, and destroyed by their successors—errors overcome and chased away only by some new illusion which departs in its turn—discoveries which do not expand the limits of truth, but only narrow the reign of established error—paradoxes which amuse laborious idleness, and provoke the ridicule of the world—infinite and rapid movement without visible progress—such are the discouraging aspects which this science has presented in all ages. Whether it be that the science really opens little field for discovery, because the *elements* of our intellectual operations, which are its true object, being few and palpable, have been universally recognised in all ages, we presume not to determine. But of this at least every student of the philosophy of mind must be aware—that the discussions of metaphysicians have, in general, resembled rather the fantastic evolutions of the mimic-actors in great affairs, than the earnest exhibitions of those who had something substantial to contend for, and that their works, as if without a base on which to poise themselves, have tottered and sunk into oblivion in sure and melancholy succession.

It seems to be the tendency of this science to seduce the mind into a fondness for subtle distinctions, equally unprofitable as it is dangerous. The most vigorous intellects, once led into this course, are apt to pursue it to the farthest limits of extravagance; and, in proportion as they ascend to the elementary sources of thought, appear to recede from the solidity of common sense. The profound and sagacious Locke himself has, in more than one instance, fallen a victim to this fatal propensity. Not to mention his strange doctrine on the subject of mental identity, his *Conceptualism*, to which we have already had occasion to allude, betrayed him into an extravagance which rendered this mighty sage the sport of every witling, and an object of the compassion even of the vulgar. If such was the fate of a mind like Locke's, what may we not expect from the humbler cultivators of a province of philosophy, of which the very atmosphere seems to be fraught with the elements of mental intoxication?

It was the fortune of Aristotle to become the master of human intellect for ages, and to establish an empire of dogmatism which was nearly commensurate with the expanse of human thought. There was much that was wrong in this celebrated system, chiefly superinduced by its semi-barbarous and pedantic expounders; but there was also much that was just and profound, and therefore immutable, in the views and doctrines of its great author. What has happened since this mighty

intellectual despotism was shattered and dissolved? A succession of errors, in this department of science at least, with a very slow and measured progress of truth. The sagacity of Bacon, indeed, pointed to a wiser and better form of investigation for the advancement of physical knowledge than had hitherto been pursued; he fixed attention upon the method of induction, and developed with greater precision its laws; for it is absurd to consider him as the *inventor* of a process, which, in its principle, was coeval with the existence of man, and the development of human thought. He rather summoned the regards of men from the barren pursuits of controversy to those of genuine science, than invented any thing at all—he was rather a monitor than a creator or discoverer. But great as the obligations of mankind are to this mighty genius, his admonitions have not been able to save the science of mind from the greatest errors, and the most extravagant absurdities, committed too, not by men of small intellect, and mean attainments, but by the most distinguished philosophers. We have since his time had Berkeley laboriously disproving the existence of a material world—we have had Hume disputing whether we have any idea of cause and effect, power and necessary connection; and now we have the author before us denying altogether the existence of mental powers, resolving every thing into suggestions and sequences, and essaying a revolution in this most unstable of sciences, by the help of a theory identical in principle, and varying in name only, from one which has long been exploded by the common consent of philosophers. And all this singular and startling collision of opinions and theories has been exemplified, while there was no dispute about the actual phenomena, and no addition whatever had been made to our stock of observations—while the elements remained entire and unchanged—and the whole controversy referred to the *mode* in which they were to be disposed of, and the nomenclature by which their combinations were to be denoted.

We are not, however, to suppose that the study of the philosophy of mind is, for these reasons, to be abandoned. Such discussions, besides their other important uses, sharpen and invigorate the mind, and gratify, if they cannot satiate, a curiosity which is unquenchable in the highest and most powerful intellects. The science is to be encouraged, because the inquiries which it embraces are felt to be curious, and interesting in the highest degree. Around the recesses of intellect which we may never be able thoroughly to penetrate, we yet linger with anxious scru-

tiny—and it becomes important, therefore, to fling upon them the steadiest and clearest lights which our limited capacities afford. If the researches of metaphysics had about them no native and resistless attractions—if they mingled not essentially with other processes of thought, of which the utility is conspicuous, and the delight acknowledged—we might safely throw them aside, and find an excuse in their obscurity and uncertainty for the indolence which should refrain from every attempt to penetrate the highest mysteries of our nature. But it is not so—all human speculation has reference to the laws of its great intellectual organ; all our inquiries must be unsatisfactory without some knowledge of the mysterious instrument by which they are conducted; and even in our search after the knowledge of matter, it behoves us to know something of that mind by which alone matter itself is known. The legitimate range and limits of human thought, must be understood by us before we can safely speculate on any subject without the risk of transgressing the boundaries, beyond which all our toils must be at once unprofitable and irksome. The fact that the mightiest minds the world has ever seen, have been irresistibly directed into that course of metaphysical inquiry which the vulgar despise, is a strong proof of its irresistible claims upon our attention—and the extravagancies into which they have been betrayed, shew how natural and despotic must be the influence of speculations, of which the very illusions hold *them* chained to absurdity. The philosophy of mind may not, perhaps, boast of discoveries so brilliant as those of physical science—for in the attempt to trace the current of thought to its source, we must soon arrive at a point where all is subtile and evanescent. It is not so much a science by itself as the groundwork of all other science—it does not so much display a vast and various field of discovery, as invigorate that keen and powerful instrument by which all discoveries are to be made. But it is not as a branch of *physiology*—as exhibiting a mere *sequence of phenomena*—that, in our humble opinion, it is to be cultivated to the greatest advantage. The phenomena *can* have nothing novel in them; they have been present to the consciousness of all men in all ages—their existence is implied as much in the reasonings and conduct of the vulgar, as in the most sublime philosophical speculations. The science of mind is one chiefly of arrangement and classification—a search for final and ultimate laws of human thought and belief, by which, if they were once thoroughly ascertained, most

of the difficulties would be removed, which perplex human speculation by the denial of first principles, by the introduction of *reasoning* where every process of that kind must be vain, and by the parade of scepticism where the sceptic is rebuked by the universal and indomitable feelings of human nature. This science, in fine, settles doubts rather than makes discoveries—doubts that belong to the inmost secrecy of the human breast; and which, if not wisely treated, painfully mingle, with all its deepest principles of speculation, all its most cherished feelings for the present, and all its brightest hopes of futurity.

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